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THERAPEUTICS AND PUBLIC HEALTH.

EDITED BY

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THE PRACTITIONER.

JULY, 1878.

Original Communications.

THE NUMERATION OF BLOOD CORPUSCLES, AND THE EFFECT OF IRON AND PHOSPHORUS ON THE BLOOD.

BY W. R. GOWERS, M.D.,

Assistant Professor of Clinical Medicine in University College.

THE application to clinical medicine of the method of ascertaining the corpuscular richness of the blood has enlarged the field of observation in both pathology and therapeutics. By the labours of Malassez, Hayem, Keyes, Cutler, Bradford, and others, some facts have been already ascertained, which constitute and promise important additions to our knowledge of the characters of certain morbid processes in the blood, and the manner in which they are influenced by drugs.

Since the method is still, to a great extent, new to clinical medicine, especially in this country, and is of importance in therapeutical investigation, it may be well to describe it in detail.

The method employed is that originated by Vierordt and Welcker, and adapted to clinical use by Potain, Malassez, and Hayem, of making a definite dilution of a certain quantity of the blood, and counting the number of corpuscles in a certain volume of that dilution. The variations in the details of the process which have been made by the various workers refer mainly to the method of obtaining a given volume of dilution. In all the instruments which are adapted for clinical use the dilution

is placed in a chamber of a certain depth, which can be put on the stage of a microscope. In Malassez's instrument this chamber is a capillary tube, in Hayem's the inconvenience arising from the curved surfaces of the tube is avoided by employing a flat cell. The lateral dimension of the volume observed are obtained, by Malassez and Hayem, by divisions in the eye-piece of the microscope. To avoid the inconvenience arising from the necessity which this imposes, of always employing the same microscope, I have arranged a modification of Hayem's instrument, in which the lateral divisions are ruled on the bottom of the cell, so that the instrument can be employed with any microscope, and its convenient use is thus greatly extended. Moreover, by an arrangement for securing the cover-glass by springs, the accuracy of the instrument is increased, and by employing a dilution and an area different from those hitherto used, the process of ascertaining and of expressing the corpuscular richness of the blood is much facilitated. The percentage relation to the normal is at once obtained, instead of merely the number per cubic millimeter of blood. The French instrument has been termed a *hematomètre*, but since it is not the quantity, or even the whole quality, of the composite blood, but only the quantity of the blood corpuscles which is ascertained, the term *hæmacytometer* seems a more accurate designation.¹

In outward form the apparatus is similar to that of Hayem, and consists of the parts shown in the accompanying figure.

(1) A pipette (Fig. 1, A) graduated to 995 cubic millimeters, for measuring the diluting solution.

(2) A capillary tube (B), for measuring the blood to be diluted, and containing in the length marked five cubic millimeters. For convenient use a piece of elastic tubing is attached to each of these measures.

(3) A small glass jar (D) in which the dilution is made, and the blood and solution thoroughly mixed by the small spud (E).

(4) The cell (C), in which a small quantity of the dilution is placed for counting. This is exactly one-fifth of a millimeter deep. The glass slide at the bottom of the cell is divided in the centre into squares, each one-tenth of a millimeter in length

¹ The instrument was described in the *Lancet* for December 1, 1877. It is made by Mr. Hawksley, 300, Oxford Street.

and breadth. The slide bearing the cell is fixed on a metal plate, from which two springs project on to the edges of the cell, for the purpose of keeping the cover-glass in position with a steady pressure, so as to secure perfect uniformity in the depth of the cell. When, as in Hayem's instrument, the cover-glass is

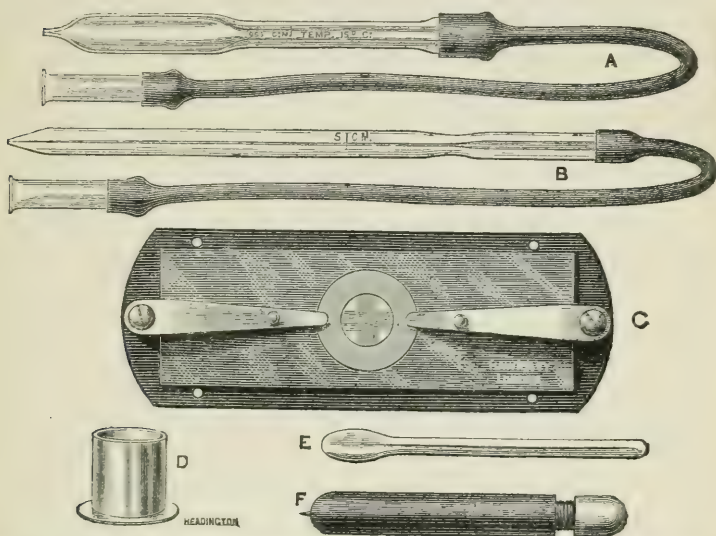


FIG. 1.—Apparatus for counting the blood corpuscles. A. Pipette for measuring the diluting solution. B. Capillary tube for measuring the blood. C. Cell with divisions in the floor, mounted on a slide to which springs are fixed to secure the cover-glass. D. Vessel in which the dilution is made. E. Spud for mixing the blood and solution. F. Guarded needle.

secured by liquid beneath its edge, a little more or less of this liquid influences the closeness of the contact of the glass and the edges of the cell, and, consequently, the depth of the cell.

In use, the drop of dilution placed in the cell is in contact with the cover-glass, the corpuscles sink in a few minutes to the bottom, and are seen lying in the squares. No difficulty is experienced in seeing, at the same time, the corpuscles and the divisions, and the number in a square, or series of squares, can easily be counted.

The dilution of 5 c.mm. (cubic millimeters) of blood in 995 c.mm. of solution is 1 in 200. Each square contains the corpuscles from a volume of dilution, one-fifth mm. in one, and one-tenth mm. in each of the other dimensions, *i.e.* two cubic

tenths of a millimeter, or the '002 part of a cubic millimeter. But the dilution being 1 in 200, this volume of dilution contains just '00001 c.mm. of blood. The number of corpuscles in a square multiplied by 100,000 is thus the number in a cubic millimeter of blood. In order to avoid error, the number of corpuscles in ten squares should be counted, and this number, multiplied by 10,000, is the number per c.mm. The average number in health has been determined by several observers to be 5,000,000 : blood of this richness will contain then 50 corpuscles per square. But this dilution and this division gives a much simpler mode of statement. With normal blood the average number of corpuscles in two squares (containing '00002 c.mm. of blood) is 100. The average number in two squares thus expresses the percentage relation of the blood examined to normal blood. I propose therefore to take this volume of blood, '00002 c.mm., as the standard volume, and to term it "hæmic unit." Thus the number of red corpuscles per hæmic unit is the percentage proportion to health.

Taking the maximum proportion of white to red as about 1 to 330, we shall have '3 white corpuscles as the normal maximum per hæmic unit. When the white corpuscles are in normal, or nearly normal proportion, it is necessary to observe the number contained in a considerable number of squares, and take the average. This may be readily done in the method to be described presently. When the white are in great excess, as in leucocythæmia, they may be counted at the same time and in the same squares as the red corpuscles.

Various diluting solutions have been proposed, some of which are given below.¹ The solution of sulphate of soda, specific

¹ Diluting solutions :—

A solution of sulphate of soda and distilled water of specific gravity 1025.

Potain's Solution :—

Solution of gum acacia sp. gr. 1020.

One volume.

Equal parts of sulphate of soda and chloride of sodium, in solution of specific gravity 1020.

Three volumes.

Keyes' Solution :—

"Take urine slightly phosphatic, easily obtainable after a meal, about 1020 sp. gr., and make of it a saturated solution with borax. Clouds of earthy phosphates are thrown down. Filtration yields a clear alkaline fluid of sp. gr. about 1030. Add one-half of water, or enough to reduce the specific gravity to 1020, and the fluid is ready for use."⁵⁷

gravity 1025, answers very well, but becomes after a time turbid from organisms. The endeavours which have been made to find a solution which shall not change the appearance of the corpuscles is somewhat unnecessary, since whatever solution is employed, the corpuscles are altered by it, and if it is desired to observe their characters this should be done in a little undiluted blood on a separate slide, in the ordinary manner.

It is important to obtain the blood without pressure: if the finger is forcibly squeezed or is ligatured the proportion of serum and corpuscles is altered. This is a fertile source of discrepancies in observation. Hence the puncture should be made with a flat needle. The more forcibly it is made, the less is the pain. Dr. Horace Dobell many years ago contrived an ingenious instrument for making a forcible puncture through the skin, and at the same time exhausting the air over the place punctured so as to obtain a freer flow of blood. I find, however, that this does more than is necessary, and have arranged a guarded needle (F, Fig. 1), which can be projected to the desired extent from a small wooden case. With this a firm blow can be given to the skin, and the puncture is then scarcely felt; sometimes indeed is not felt at all.

The blood may be obtained from any part; but the top of the finger is perhaps more convenient than any other.

For the guidance of those who may use the instrument it may be well to describe in detail the method and precautions which I have found advisable.

Before commencing, care should be taken that the mixing jar, cell and cover glass are perfectly dry and clean. A glass of water should be in readiness in which to place the pipette and tube immediately after use. The desired volume of diluting solution is then measured; more should be drawn up into the pipette than the required quantity, and the india-rubber tube compressed, or the pipette placed horizontally, and then, by gently squeezing the tube below the point compressed, or inclining it a little from the horizontal, the excess may be allowed to escape until the upper level of the liquid is exactly opposite the division. The point of the pipette should be placed upon a cloth or handkerchief during the process, so that the excess may

be removed from the point as it escapes, and no drop should adhere to the exterior. The measured volume should then be ejected into the mixing jar. Before pricking the finger the capillary tube should be prepared, the end of the india-rubber tube being placed in the mouth. The finger may be rubbed for a moment but should not be squeezed. The prick having been made by a sharp blow from the guarded needle above described, the point of the tube is placed in the drop of blood which escapes and the blood drawn into the tube above the mark upon it. Care must be taken that no air-bubbles pass into the tube: if this happens the air must be ejected and fresh blood drawn in. Having drawn in a sufficient quantity of blood, the point of the tube must be placed in the soft cloth, and the tube gently rotated while the superfluous blood is being ejected, until the level of the blood exactly corresponds to the mark. This method ensures the removal of all blood from the outside of the point. If only the desired quantity is drawn into the tube, and the blood from the point then removed by the cloth, some blood is sure to be drawn out of the tube at the same time. As soon as the measure is accurately obtained, the point of the tube is placed in contact with the surface of the liquid in the diluting jar and the blood ejected, a little liquid being drawn into the tube after the blood has been driven out, so as to remove any remaining corpuscles. The blood sinks to the bottom of the liquid, and by a quick rotation of the spud between the thumb and finger the blood and solution are thoroughly mixed. A drop of this mixture is then at once taken on the spud (the smaller end of which is more convenient than the larger end) and placed in the centre of the cell. The cover-glass is gently dropped on to the cell, and comes in contact with the liquid, which spreads between the two in a small circular area. The springs are then adjusted on the cover-glass, and the cell placed on the stage of the microscope.

For the numeration any lens will suffice which gives sufficient magnification to render the corpuscles distinct, and has not so short a focus that it comes in contact with the cover-glass. A $\frac{1}{4}$ or $\frac{1}{2}$ inch lens, or No. 7 Hartnack answers perfectly. The

lens is focussed on to the squares, above which the corpuscles are floating. In three or four minutes all have sunk on to the squares, and none are visible when the focus is raised above the squares. The numbers in ten or twenty squares are then counted, any corpuscle upon the line being counted as belonging to the square in which the larger part of its bulk lies. Care should be taken to choose for counting those parts in which the corpuscles are evenly distributed, and hence the neighbourhood of the edges of the drop should be avoided. It will be observed that the diluting solution sometimes changes some of the corpuscles in a different way from others, shrinking some and inflating others. The latter may be mistaken for white corpuscles but attention to the following precaution will prevent any error. The white corpuscles are always distinctly granular, and if the lens be raised until the corpuscles are fading out of focus, the greater refracting power of the white corpuscles renders them conspicuous as luminous bodies and thus any chance of error is avoided.

This mode of observing the white corpuscles may be made available for rapidly ascertaining the number of white corpuscles when they are not in great excess. Having first ascertained the average number of red corpuscles per square, note the total number of squares which are included in the field of the microscope. Then, raising the focus until the white corpuscles are conspicuously differentiated, those in the field can readily be counted, and the number in a series of *fields* may be noted, care being taken to move the slide methodically, so that the same fields are not counted more than once. For instance, supposing the number of red corpuscles per square is 40 (equal to 80 per hæmic unit, *i.e.*, per cent.), and twelve squares are contained in each field, and a series of ten fields contain altogether twelve white corpuscles. This will give twelve white corpuscles to $(40 \times 12 \times 10)$ 4,800 red or 1 white to 400 red.

The time needed for the whole process from beginning to end is not more than a quarter of an hour or twenty minutes.

In such an apparatus extreme exactness in the instruments is of course essential. I may therefore state that very great pains have been taken by Mr. Hawksley to secure this, the standards having been prepared in the laboratory of University

College, and in their preparation Professor Burdon Sanderson has given his kind assistance.

The variations in the number of corpuscles may be recorded on charts which have been prepared for the purpose, in which the lowest two divisions are of greater width for the record of the variation in the white corpuscles when these do not greatly exceed the normal number (see Fig. 5). Thus the precise relation of the red and white is at once evident.

The following cases illustrate the use of the hæmacytometer mainly as a means of observing the action of remedies in the blood; but they also show, incidentally, that the method opens up an important field for observation on the nature of certain pathological processes in the blood.

The two first cases were observed to note the effect of iron in augmenting the corpuscular richness of the blood, and also to ascertain whether this effect was well marked in the case of a preparation of iron, which under the terms chloroxide or oxychloride, or dialysed iron, has of late come into extensive use. The second of these cases has been already published in the *Lancet*. I therefore merely here reproduce the chart which records the variations in the number of blood corpuscles, and which conveys the history of the case in sufficient detail for my present purpose.

E. B., a girl aged 34, presented herself among my out-patients on February 20th, suffering from pallor and shortness of breath, inframammary pain, and giddiness on exertion. The heart was slightly dilated, and a loud pulmonary murmur could be heard. The catamenia were regular. The skin was very pale, the lips pale red, but there was still a little colour in the cheeks. The red corpuscles under the microscope appeared pale, and smaller than normal (on measurement). They were found on numeration to be 47 per cent. of the normal (2,350,000 per cubic millimeter). The white corpuscles were 1 to 285 red. She was ordered Liq. Ferri chloroxidi ℥ xx. and Liq. Bism. et Ammon. citratis ℥ xx. three times a day. On February 27th, a week later, the red corpuscles had risen to 56 per cent. (see chart, Fig. 2); on March 6th to 68 per cent.; on March 13th to 85 per cent. and on March 27 to 98 per cent. In spite of this rapid rise in the number of corpuscles there was only a

slight improvement in the patient's appearance. She was almost as pale as before. The amount of hæmoglobin in the blood was then tested roughly, taking the colour of the blood as an indica-

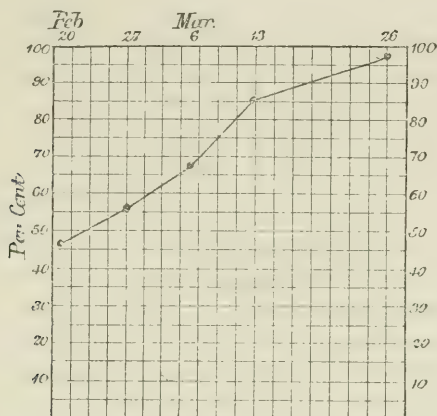


FIG. 2.—Rise in the number of corpuscles under the influence of iron.

tion of its amount. It was found to be only 30 per cent. of the normal when the corpuscles had risen to 98 per cent. Subsequently, however, there was a steady improvement in her colour, although no observations on the number of corpuscles were made for some time. When they were counted, a month later, they had fallen a little in number. On May 22nd her colour was completely regained, and her aspect that of perfect health. The corpuscles were then 102 per cent.

This case is of interest in several particulars. It shows what a rapid and regular augmentation in the number of the corpuscles may be effected by iron, and that this effect is produced with perfect efficiency, by the chloroxide of iron. The manner in which the anæmia was removed is, however, not a little remarkable. The most characteristic effect of iron is believed, and rightly, to be an increase in the hæmaglobin of the blood; an improvement in its colour. It has been denied, indeed, that it is capable of causing an increase in the number of corpuscles, but that it does increase the number is sufficiently proved by this and the following observations, confirming, as they do, those

of Hayem and others. Moreover, the case shows that the primary effect of the administration of the iron may be an increase in the globules, out of all proportion to the increase in the hæmoglobin, and that the rise in the latter may be accompanied by an actual decrease in the number of globules. Hayem rightly urges that it is not until the quality of the corpuscles is brought up to the normal, and the tint of the blood is such as corresponds to the number of normal globules, that the anæmia can be considered to be cured. But it is evident that when such rapid increase in number occurs, we have strong reason to believe that an increase in their quality will follow, and thus the process of numeration affords a prognostic indication that the medicine given is doing good, and that the patient will regain health, an indication which is not furnished by any other method of examination.

That a process of blood restoration, ultimately perfect, should commence with an increase in the number of globules without corresponding improvement in their tint, shows that, in laying stress on the latter as the essential element in the cure of anæmia, we must not undervalue the former. This has been done, I think, by Hayem in a recent paper on the action of ferrocyanide of potassium. He administered this drug to two chlorotic girls, and found in each a rapid increase in the number of corpuscles, without corresponding increase in the hæmoglobin. When the corpuscles had risen almost to the normal, he substituted iron; the corpuscles fell somewhat in number, but the amount of hæmoglobin increased until the "value" of the corpuscles was that of health. Hence he concludes that ferrocyanide of potassium is quite useless in the treatment of anæmia, because it increases only the number, and leaves the "value" of the corpuscles far below the normal. But the changes in the blood in the case I have related were almost the same, although an efficient preparation of iron was administered. The augmentation in number progressed for five weeks before any notable rise in value occurred. In each of his cases it is to be noted that a distinct rise in the amount of hæmoglobin occurred, amounting in one case to one-half, under the influence of the ferrocyanide, although the increase in the number of corpuscles was so great, from 3,000,000 to 5,400,000 per cubic millimetre, that the value

of each corpuscle fell slightly. It is evident, however, that each element in blood formation was stimulated, but the one out of all proportion to the other.

These facts are alluded to because these cases illustrate the need there is for further observation on the form of the process of blood regeneration, in order that our knowledge of the effects of remedies upon it may be accurate.

The accompanying chart (from the *Lancet* of May 11) indicates the progressive variation in the number of corpuscles, under various influences, in a girl who suffered from extreme anæmia, the corpuscles, when she came under treatment, being only 26 per cent. (1,300,000 per cub. mm.). Under the influence of chloroxide of iron and rest and good diet they steadily rose to 76 per cent., and then fell on the occurrence of the catamenia (*b*) for the first time for several months. They rose again when the period was over. They then fell coincidently with an attack of gastric catarrh. A visit to Brighton was followed by a very rapid rise, continuing for a week after her return to town, when the highest point, 92 per cent., was attained. A sudden fall then occurred, accompanying the occurrence of the catamenia, but commencing the day before the "period," the number rising again during the latter part of the period. The iron was then omitted (at *e*), and the corpuscles fell, to rise again when the iron was resumed (at *d*). In the third period, which occurred just after this resumption of the iron, the catamenial fall was not observed.

In this case the colour of the blood was not measured, but the patient's appearance improved in a most striking manner as the corpuscles increased in number, so that there can be no doubt that the value of the corpuscles was proportioned to their number. The influence of the iron was marked, not only when first given, but also when resumed. The effect of Brighton air was also very distinct. The fall in the corpuscular richness of the blood, coincident with the first part of the two catamenial periods, but also occurring before them, is of considerable physiological interest, but further observations are necessary to show how far it is a general phenomenon.

The next two cases illustrate the hæmatinic influence of free phosphorus. Both were cases of lymphadenoma, the phosphorus

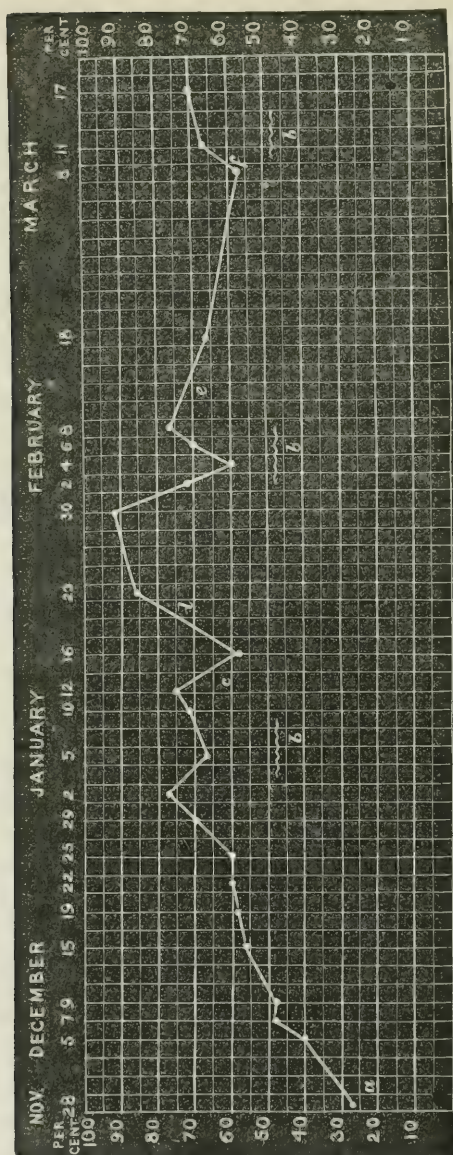


FIG. 3.—Variation in the number of blood corpuscles in a case of anemia. For the description see text, p. 11.

being given with the hope of diminishing the growths, and the remarkable improvement in the blood state which each presented without marked effect on the growth, was somewhat unex-

pected. The patients were shown at the discussion at the Pathological Society.

A. L., a girl, aged twenty-one, was sent to me at University College Hospital by Mr. Heath in December, 1877. There was no family history of glandular disease. Ten years ago the glands in the right axilla commenced to enlarge, and continued gradually to increase in size for six years, and then, four years ago, nine of these glands were excised by Mr. Heath, one being left. Erysipelas followed the operation, and three abscesses formed on the inner side of the arm. Three years after the operation, the small gland remaining having been quite stationary, the glands in the right side of the neck began to enlarge, and have continued to increase in size. When she was first seen, her aspect was florid, partly from dilated vessels in the face. The lips, however, were well coloured. Behind the angle of the jaw, on the right side of the neck, was a large swelling due to enlarged glands, and from it other glandular swellings extended to the occiput above and to the clavicle below. Those in the latter situation were each

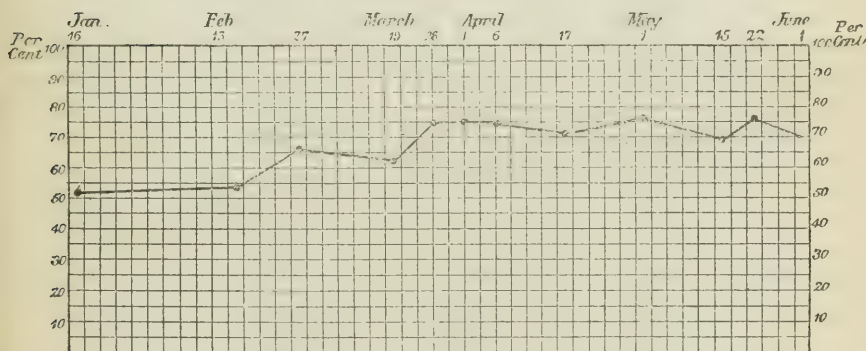


FIG. 4.—Rise in the number of corpuscles under the influence of phosphorus.

about the size of an almond; those behind and below the ear were of the size of a walnut. The right tonsil and the glands at the root of the tongue were also enlarged. On Dec. 19th she was placed on phosphorus, $\frac{1}{30}$ th of a grain in resin pill twice a day.

In the beginning of January two fresh glands enlarged in front of the ear. On Jan. 6th the corpuscles were counted for the first time, and found to be 52 per cent., and the white corpuscles 1 to 300 red (see chart, Fig. 4). On Jan. 16th the dose of phosphorus was increased to $\frac{1}{25}$ th, and on the 23rd to $\frac{1}{20}$ th of a grain. On Jan. 30th the glands were distinctly smaller, and the patient so conscious of the improvement that she had doubled the dose, taking two pills instead of one. Vomiting was produced, and the pills evidently were not absorbed. $\frac{1}{15}$ th of a grain was ordered three times a day.

On Feb. 13th the corpuscles were 54 per cent., and the white 1 to 700 red. Considerable doubt being felt whether much of the phosphorus in the resin pills was absorbed, on account of the impunity with which a considerable number of the pills had been taken, phosphorised oil given in *perles* was substituted, $\frac{1}{30}$ th of a grain of phosphorus being given three times a day.

On Feb. 27th the red corpuscles had increased to 66 per cent., and the dose was ordered to be taken four times a day, and on March 6th five times a day.

On March 19th the red corpuscles were 62 per cent., and the dose was ordered to be taken six times a day—to a total of $\frac{1}{6}$ th of a grain of phosphorus daily. The urine was examined regularly. It gave a precipitate of phosphates, but no albumen. On March 26th the corpuscles had increased to 75 per cent. On April 10th the corpuscles were still 75 per cent., but the patient was feverish: temperature 100·5. The large gland behind the ear had decreased in size from $1\frac{1}{2}$ to $1\frac{1}{4}$ inches; but a fresh gland had enlarged under the jaw. There was much pain in the back of the head and eyes. No albumen in the urine.

The phosphorus did not appear on the whole to be exercising any beneficial influence on the growths. It was therefore omitted, and arsenic substituted, m. iv. of Liq. arsenicalis three times a day.

On April 17th the corpuscles were 73 per cent., and on May 1st 76 per cent. The glands beneath the jaw were much more tender, so as to be painful when she chewed.

On May 15th the corpuscles had fallen to 68 per cent., but on the 22nd they were again 76 per cent. The glands were thought to be a little smaller. The dose of Liq. arsenicalis had been

gradually increased to ten minims three times a day. On the 25th there was more pain in the glands, which were certainly both smaller and softer. The pain was sufficient to interfere with sleep at night. No gastric symptoms had resulted from the use of the arsenic. On June 1st the corpuscles were 70 per cent., but she had been obliged to discontinue the arsenic three days previously owing to congestion of the throat and conjunctivæ. The glands were still tender and painful.

On June 12th the pain in the glands and tenderness had disappeared; there was a curious congestion of the backs of the wrists, accompanied with desquamation there and on the fingers, which she attributed to the arsenic. The red corpuscles were 76 per cent., and the colour of the blood corresponded to 80 per cent. of colouring matter.

This patient is still under treatment, but the case is complete so far as concerns the influence of phosphorus on the blood, which is of considerable interest in connection with the case to be next described.

W. B., a man aged thirty-six, was sent up to Mr. Christopher Heath by Mr. Saunders of Pembroke Dock. The case being unfitted for operation, the patient was transferred to the medical ward, and (by the kindness of Dr. Ringer) was placed under my care. The patient was a large, well-built man, fairly well coloured, but with slight pallor of mucous membranes. In the right side of the neck was a large mass, the size of a cocoa-nut, irregularly lobulated, projecting down in front of the clavicle, and extending to the left an inch beyond the middle of the sternum, and on the right as far as the junction of the middle and outer third of the clavicle, and as high as the level of the cricoid cartilage. Some of the lobules were separately movable. The length was ten inches and width five. Above it were several small enlarged glands. A few glands were enlarged in the right axilla. The tumour had commenced by enlargement of the glands in the posterior triangle of the neck sixteen months before admission, and had been steadily increasing in size; the increase being especially marked during the preceding six weeks.

On Feb. 6th the red corpuscles were found to be 62 per cent. of the normal, *i.e.* 62 per hæmic unit (3,100,000 per cubic mm.). The white corpuscles were '9 per hæmic unit (45,000 per cubic

mm.) (see chart, Fig. 5) ; a reduction of the red to two-thirds of the normal, and an increase of the white to three times the normal maximum, the proportion of white to red being about 1 to 70. The white were of normal size and presented two or three nuclei. Many of them presented fatty degeneration. Phosphorus

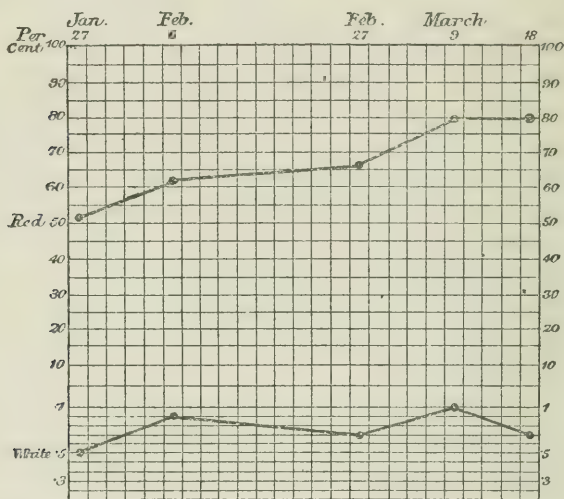


FIG. 5.—Rise in the number of corpuscles under the influence of phosphorus.

was ordered, $\frac{1}{30}$ th of a grain three times a day in a resin pill. On the 16th the phosphorus perles were substituted for the resin pills. On Feb. 27th the blood was again counted, and the red corpuscles were found to have risen to 68 per cent. The white corpuscles had fallen to 7 per hæmic unit. The patient's general health continued as good as before, and he complained of no other symptom from the phosphorus than a sense of great general heat. On March 9th the red corpuscles were 80 per cent. and the white 1 per hæmic unit. On March 18th the red corpuscles were still 80 per cent., and the white ones 7 per hæmic unit. No appreciable effect was produced upon the glandular growth. The lower and most prominent part was much softer than before, and the cutaneous vessels on it were enlarged, and the skin discoloured. The patient, however, persisted in leaving the hospital.

These two cases thus both presented a remarkable increase in the globular richness of the blood during the administration of phosphorus, amounting in each to about 20 per cent. In neither case was there any other influence in operation to which the effect could well be ascribed. The first patient was treated throughout as an out-patient. She continued her occupation and lived, as far as could be ascertained, in precisely the same conditions during the whole of the treatment. The second patient was treated in the hospital, but he was a man in a good situation on a railway, and had been able to obtain a sufficient supply of food.

This effect is in harmony with the observation of Dr. Broadbent on the rapid disappearance of anæmia, in a boy with an enlarged spleen, during the administration of phosphorus. It has been found that arsenic is capable of producing a similar effect. In pernicious anæmia Dr. Byron Bramwell found the blood state was distinctly improved by its use; and recently a temporary increase in the number of blood corpuscles has been demonstrated by Drs. Cutler and Bradford of Boston, to occur from the administration of arsenic in anæmia. We know, from the effect of these agents on certain skin diseases, that they are capable of influencing in a very remarkable way some deranged processes of tissue formation, and it appears that their effect on the process of blood formation may be of the same character.

In conclusion, it may be remarked that the facts which the hæmacytometer demonstrates afford a very striking illustration of the fallacy of inferring from the action of drugs in health, what will be their action in disease. Iron, arsenic, phosphorus, and cod-liver oil have all been demonstrated to be capable of increasing the number of blood corpuscles when these are deficient, and it has been found by Cutler and Bradford with regard to iron, arsenic, and cod-liver oil, and it is in high degree probable in the case of phosphorus, that in health no such increase is produced by their administration. The observations of Keyes have established that the beneficial influence of mercury on the blood in syphilis is absent in health, although this fact is of a somewhat different character from the others since mercury has so special an influence on the pathological state on which the observations were made.

OCCURRENCE OF HERPES DURING THE ADMINISTRATION OF ARSENIC.

BY JAMES FINLAYSON, M.D.,

Physician and Lecturer on Clinical Medicine to the Glasgow Western Infirmary.

A YOUNG lady, rather subject to acne of the face, was ordered in April, 1876, small doses of Fowler's solution, to be taken thrice a day. This had a good effect, but I supposed the medicine had been stopped, as I was frequently seeing the lady casually in connection with a more serious case, and I had not been spoken to on the subject again. It appeared, however, that she had been taking the medicine regularly on till August, although she said not always thrice a day as at first. The medicine had not disagreed with the stomach in any way. She came from the country on August 19th to consult me about an eruption on the right arm; it extended from the lower part of the upper arm down the back of the forearm and hand, including the back of the fingers. The eruption had been out for two or three days, and was associated with severe pain, sufficient to interfere with her sleep for several nights. There had been also considerable pain about the shoulder. The eruption consisted of clusters of vesicles situated on an inflamed base. The arsenic was stopped and some local and general treatment prescribed. I did not see the eruption again, but I learned that it slowly died away without any complication arising.

The eruption in this case followed the long axis of the limb as seems to be usual in cases of herpes affecting such parts.

Very soon another instance came under my notice at the Western Infirmary. A girl twelve years old was admitted with

chorea on January 11th, 1877. She had had an attack of acute rheumatism when nine years old. She was ordered $2\frac{1}{2}$ minims of the acid solution of arsenic thrice a day, along with iron, on January 12th; this was changed to three minims of Fowler's solution on February 20th, and on March 8th this was increased to five minims. The chorea after a slight improvement had become worse, and her recovery was somewhat slow. On March 20th patches of herpes zoster appeared on the left side of the chest, extending from the region of the cardiac apex round towards the spine. No special pain attended this eruption, which was not by any means characterised by much inflammation. The eruption did not at all interfere with the recovery; this, indeed, became more distinct just about this time, and the child was shortly afterwards sent to the country.

Notwithstanding the cases adduced by Mr. Jonathan Hutchinson, some authorities doubt the reality of the connection between the use of arsenic and the appearance of herpes; these cases are submitted as a small contribution to his subject, which has many points of great general interest.

THE TREATMENT OF THE PYREXIA OF ENTERIC FEVER.

BY J. GREIG SMITH, M.A., M.B.,

Medical Superintendent Bristol Royal Infirmary.

NOT yet has the medical profession in England agreed as to the advisability of treating the pyrexia of enteric fever. Imposing statistics from our brethren in Germany have been before us for some years, but they have not succeeded in fully converting us. Stray papers in our periodicals tell us how the antipyretic treatment has been taken up here and there by fits and starts, but scarcely anywhere does it seem to have been adopted in that thorough and systematic manner which, we are told, is necessary for its success.

At the Bristol Royal Infirmary, during the last eighteen months, about one-half of the cases of enteric fever have been treated on this plan. In every instance careful records were kept so as to be easily tabulated for comparison. Our observations, though by no means extensive enough to enable us to draw conclusions as to the effect of the treatment on the death-rate, have given us some useful information on the best means of reducing pyrexia, and the various conditions and circumstances which regulate the application of the treatment. It is thought that now, while the method is still on its trial, the results of our experience might be acceptable to the profession.

It is not my purpose to discuss the *rationale* of the treatment. I take it for granted that it has a real physiological and pathological foundation, and look at it solely from its clinical aspect. It may even be that the hypothesis on which the treatment is grounded is entirely wrong; but this does not at all affect the

practical outcome of the treatment. Be it granular degeneration of the heart muscle, or lesion of the nerve-centres, or both, that our efforts seek to ward off, matters not beyond the supplying of a scientific basis to work upon. It will suffice if high temperature is recognised as a condition, *per se*, conducive to mortality, and if the successful combating of this condition is found to lower the death-rate. The principle would have its foundation on the most trustworthy of the inductive methods, and we should be bound to give it our rational assent. I need only add that both propositions have been answered emphatically in the affirmative by our continental neighbours, and it will be at once admitted that we in England are fully justified in putting our patients and ourselves to the trouble of acting upon them.

Our experience of the methods available for the reduction of temperature in enteric fever has led to a preference for the combined action of quinine and cold bathing. The one is made to supplement the other, and it is thought that the best results are got from the conjoint use of both.

A statement of the reasons for this selection involves a criticism of the other methods recommended.

First, as to the physical means of applying cold to the surface.

Sponging the surface with cold water, or cold water and vinegar, is an old and well-tried method, easy of application and grateful to the patient. But its effect on well-marked pyrexia is very slight and transient. In an ordinary case of enteric fever, where antipyretic treatment is not called for, but where there is discomfort from the surface getting coated with the cutaneous secretions, and where the natural cooling process of evaporation from the skin is interfered with, cold sponging may be made use of with great advantage.

Robert's coil, or the passing of a current of cold water through coils of india-rubber tubing, placed under the patient's back, is a method in favour of which a good deal may be said. It is continuous and cleanly, and may be applied without the slightest disturbance of the patient. But it is troublesome, requiring the constant and undivided attention of a nurse, and by no means free from danger. It has been the apparent cause of pleurisy

with us more than once (in one instance fatal) ; and, after about twenty-four hours application, though the temperature may not be much reduced, cold extremities and feeble pulse will probably warn us of failing heart's action. And this depressing influence on the heart is perhaps the most fatal objection that can be urged against any method of treating the pyrexia of enteric fever.

The *wet sheet* is a powerful antipyretic agent. When only a single thickness is laid on, and the body left without any further covering, evaporation adds considerably to the cooling effect. Covering with several thicknesses of wetted sheets, evaporation being thus prevented, is simply a clumsy and imperfect method of cold bathing. In private practice, or where no bath is to be had, it might be employed as one of the best substitutes.

One of the most powerful antipyretic agents we have, and one likely, I believe, to be of great value in cases of sudden and intense pyrexia, such as sunstroke, is the encircling of the body in a wet sheet, and rubbing it over with blocks of ice. The direct cold of the ice, added to that got from the ice melting and evaporating on the sheet, give about as much cold as it is safe to apply to the surface of the body.

The most general objections to the wet sheet are that it is not a cleanly process, and that it is equally difficult to test the amount of cold applied and to regulate the effect of its application.

The use of *ice* in connection with the wet sheet I have spoken of. It may also be used as dry cold in flannel or gutta-percha bags. As a physical means of abstracting heat, it is open to the objections that the cold is unequally distributed, that some parts of the skin may be nearly frozen while the rest of the surface is uninfluenced, and that we lose the benefit of cleansing the skin ; while its effect through the vaso-motor system has been held forth rather as a suggestion than a demonstration.

The injection of iced water into the large bowel has been recommended in pyrexia ; but for evident reasons it is inapplicable in the pyrexia of enteric fever.

In hospital practice, and for most cases, the *cold bath* is probably the best physical means at our disposal for the

reduction of the pyrexia of enteric fever. When the system of cold bathing has once got into full swing, it gives less trouble than might be supposed. With us the method is practically that described in the *Lancet* of June 2, 1877, as in use at the London Fever Hospital. A bath is wheeled to the bedside of the patient, and, by means of pieces of tubing fitted on to the cocks, which supply hot and cold water in the scullery, opening off each ward, it is filled with water of any temperature required. The bath is left filled by the bedside of the patient, and emptied every other day. The patient is lifted in, if a child, by the arms, if an adult by means of the sheet on which he lies, and the head rests on a solid support in the bath. The sheet on which the patient is lifted in is removed to permit of the free circulation of the fluid. A dry sheet laid over the bath will prevent exposure and serve to cover and dry the patient as he is lifted out. For heavy patients a stretcher may be made of an ordinary sheet permitted to bag so as to reach the bottom of the bath, and drawn in at the top so as to form a support for the head; when the process may be gone through without removing the poles or disturbing the patient. The gradual fall of temperature is shown by a thermometer without an index placed between the cheek and the upper jaw. In the axilla we get only surface temperature, the rectum is not a choice spot; and in both axilla and rectum the temperature indicated is not the exact temperature of the body, but a rough average between that and the temperature of the water.

The effect of the bath on pyrexia will be spoken of further on. With regard to its influence on the system generally I could desire no better description than the following by Dr. McCombie, in the *Practitioner* for November, 1876:—"In all cases it diminishes restlessness and delirium; in the great majority it produces sleep, and that, too, after the patient has passed many delirious and sleepless days and nights, and even should it fail to produce sleep, almost without exception after its administration the patient doses quietly for some hours. Sleep, as a rule, follows within an hour, and continues, in some cases, two or three hours; in some three or four, and in others even five hours or longer." This is exactly what we have found. The substitution of coolness and gentle perspiration

for the heat and clamminess of the skin, and the pleasant languor of slight muscular fatigue, combine to produce a feeling of subjective ease and calm, which has its culminating point in a refreshing sleep. And if we do not have this crowning benefit of sleep we shall probably see, in the diminution of subsultus, the absence of carphologia and the improvement of delirium, decided evidence of the amelioration of nervous disturbance. Apart altogether from the temperature reduction, which is supposed to tell only in the end, we should have in the immediate improvement of the subjective conditions of the patient, almost sufficient justification for the use of the bath.

The effect of the bath on the heart is what we have to dread. If the pulse be no worse, it is all we can reasonably look for. It is nearly always slowed, often much weakened, and not infrequently, we are told, demands the administration of stimulants. Stimulants we have never once had to give to a patient in the bath, and only once after the patient was removed. This may be owing to the following: first, that the bath is not cooled down after the patient has been immersed; and, secondly, that quinine is employed if the heart's action be feeble. I am confident (though the contrary is very generally believed) that the endeavour to prepare the system for a temperature of 60° by lowering it from one of 90° in half an hour or so causes more depression than to plunge the patient at once into the requisite cold. It certainly causes more discomfort. We all know how much more bathers feel a cold of 60° in the water when they gradually walk into it from an atmospheric temperature of 80° than when they plunge into it at once. And, though our daily bath at 60° may be a pleasant enough performance, it will be found almost unbearable to have a bath at 90° gradually cooled down even to 70° . The testimony of those of our patients who have had a trial of both plans has been uniformly against the cooling down of the bath. If, then, in the elements of danger to the patient and effect on the temperature there is nothing to choose between one continuous cold of 70° and a cold varying between the extremes of 80° and 60° , we ought to abide by the more agreeable plan. In the belief that gradual cooling of the bath causes more depression, is

more disagreeable and not more effectual than keeping the patient in a cold of uniform temperature, we now follow the latter method.

Of the *drugs* in use for the reduction of temperature the best known are salicylic acid and its compounds, quinine, and digitalis.

There can be no doubt as to the value of *salicylic acid*. Given in sufficiently large doses, and with sufficient frequency, it has an undoubted and powerful effect on the reduction of temperature. But there is a great drawback to its exhibition in the depressing influence it exerts on the heart's action. And in prolonged fever, when we have to look to the heart's vigour more than anything else to tide the patient over the disease, this effect of the drug (which we have scarcely ever seen absent) is a powerful argument against its exhibition.

In acute rheumatism, lowering of the heart's force under the administration of salicylic acid and the salicylates, if it do occur to any extent, is of less moment than in continued fever. In the former instance the fever is more sthenic, and the exhibition of the drug need not be so prolonged. But, even in acute rheumatism (speaking from an experience of about two hundred cases), salicylic acid is not free from danger.

Not infrequently, on account of this depressing influence on the heart, the dose of the drug has to be diminished to such an extent as to leave but little evidence of any antipyretic action, and in five or six cases the symptoms became positively alarming. It is seldom indeed that this effect of the drug is not seen to a greater or less extent, and it is sometimes a nice question to determine when the good that results from its specific action on the rheumatic poison is not counterbalanced by its evil influence on the heart's action.

It would thus appear that, though in a sudden rise of temperature early in a case of enteric fever salicylic acid might be of undoubted benefit, it is not to be recommended for use throughout the course of the disease when it is marked by a persistent pyrexia requiring methodic and systematic treatment.

Of *digitalis*, in doses large enough to have immediate influence on the pyrexia, we have had no experience. Towards the end of the fever digitalis, in ordinary doses, and through its

best known therapeutic effects, has an apparently well deserved reputation.

Quinine is the drug which appears to give the best results. It is free of the most serious objection to the salicylates, and in the matter, pure and simple, of reduction of temperature, is at least of equal value. The only postulate is that it shall be given in sufficient quantity. Small doses—and the dose is still small at ten, twenty, or even twenty-five grains in the case of an adult—only tamper with the temperature, without controlling it. For an adult man, 35—40 grains, for an adult woman, 30—35 grains, given in three or four doses in the course of three-quarters of an hour, will probably have the desired effect. Some degree of cinchonism may ensue. There will usually be some deafness. But, in the sense of giving subjective rest and quiet, deafness may be considered rather as a good than an evil. Very rarely there is sickness and vomiting. Nearly always the pulse is improved, often markedly so. We may confidently look for an improvement in the regularity, volume, and rapidity of the pulse beat, and not infrequently there is decided increase of vascular tension and diminution of diastole. Free perspiration is common after the administration of quinine; and once there was marked increase in the urinary secretion. No further effects of any importance have been noted.

I would reiterate the importance of giving the drug in sufficient doses. If we are to expect the full influence of the drug in temperature reduction we must unhesitatingly administer it up to the very furthest limits of safety. In this Infirmary fifty grains have been given by the mouth to an adult male, and the same amount by the rectum to a girl of eighteen with no evil results. Increasing knowledge of the drug gives increasing confidence in its freedom from danger.

With the view of obtaining exact estimates of the antipyretic influence of quinine and the bath, careful records were taken of the effects of forty baths and forty doses of quinine consecutively exhibited, in cases of enteric fever. These are presented as individual experiments, whose collective evidence will show the therapeutic value of the agents in the matter of temperature reduction; they are not intended to show the effect of the antipyretic treatment on the mortality of the fever.

The points particularly noted in each experiment were the following :—

1. The temperature of the patient at the moment treatment by bath or quinine was adopted.
2. The fall in degrees directly following the treatment.
3. The length of time the temperature took to fall to its lowest point.
4. The height to which the temperature rose directly after this fall.
5. The length of time, reckoning from the commencement of the treatment, which the temperature took to reach this reactionary rise; in other words, the period of depressed temperature.
6. The temperature of the bath and the length of time during which the patient was immersed; and, to correspond with this, the dose of quinine.
7. The time that elapsed till the next call for antipyretic treatment.

To get trustworthy utterances on these points it is evident that temperatures must be very frequently registered. I need enter into no further details than to state that during critical and turning points in the curves the temperature was taken every five or ten minutes, and during the continuous rise and fall every half hour or every hour after quinine, sometimes every two hours.

The individual experiments being recorded as above, the following are the average figures got from forty doses of quinine and forty baths :—

	Bath.	Quinine.
1. Temp. for which treatment adopted...	104·75°	104·70°
2. Fall in degrees	6·05°	5·74°
3. Time in falling	32 min.	11·8 hours
4. Height of reactionary rise	103·36°	103·18°
5. Time to rise, or period of depressed temp.	6·1 hours	23 hours
6. Vigour of therapeutic means employed	{ water at 69·6° for 14 minutes }	35 grs. (about)
7. Lapse of time till next call for treatment		
	11 hrs. (about)	42 hrs. (about)

That is to say, in the case of a patient having a temperature of 104·7° Fabr., we should expect the effect of a bath and of a dose of quinine to be as follows :—After immersion in a bath

of 70° Fahr. for fourteen minutes, the temperature in eighteen minutes more falls six degrees ; thereafter it commences to rise, and six hours after the bath the temperature reaches 103·4° Fahr. After a dose of quinine, averaging about thirty-five grs. for an adult, the temperature in 11·8 hours falls 5·7° Fahr. ; it then commences to rise, and twenty-three hours after the administration of the drug reaches 103·2° Fahr. Another bath will probably be wanted in about eleven hours, and another dose of quinine in forty-two hours ; but the variations are here too great to give a trustworthy average.

It will thus be seen that the salient points of difference between the effects of quinine and the bath have reference to the length of time the temperature takes to fall, and the period during which it remains depressed. The depth of the fall, and the height of the secondary rise are practically the same. The relative amounts of difference may be thus generally expressed. Given a temperature of nearly 105° Fahr., we get after—

Temperature under 104° for				Bath.	Quinine.
		...	...	6 hours	21 hours.
„	103° „	...	...	5½ „	18 „
„	102° „	...	...	4 „	14 „
„	101° „	...	...	3 „	10 „
„	100° „	...	...	1¾ „	5 „

That is to say, the period of depressed temperature is three times longer after quinine than after the bath.

We thus arrive at some conclusions which may help to guide us in practice. The broadest therapeutic effects of a bath being a sudden fall of temperature, a speedy subsequent rise, and a soothing influence on the system, the indications for its use are, with similar broadness, a sudden high temperature not likely to be persistent, and the presence of sleeplessness or delirium. Quinine, giving a slow fall (the fall seldom begins till an hour after administration), a prolonged depression of temperature with usually some improvement in the heart's action, is indicated in cases of continued high temperature where the heart is acting feebly.

It is difficult, in general language, to go further than this. In actual practice, with definite concrete symptoms to guide us, it

will be found more easy to decide on the method to be made use of, and the proper season to employ it.

An important point to decide upon is the height to which a temperature may be permitted to rise before antipyretic treatment is adopted. In the presence of the indefinite and ever-changing combinations of symptoms which are sure to exist in any case of enteric, it is unwise to fix on any given temperature at which treatment is to be begun.

In addition to the temperature we may derive some guidance from circumstances such as the following:—

1. *Age*.—In children, though the pyrexia is usually more intense than in adults, its importance as a symptom is not so great. In children, also, the rises are more sudden and less prolonged than in adults, and there is more probability of a high temperature falling rapidly of its own accord. Antipyretic treatment, therefore, need not be so energetic in children for the double reason that the pyrexia is less dangerous and likely to be less persistent than in adults.

2. *Duration of the Pyrexia*.—The length of time for which a temperature remains over a given point must be considered as well as the height to which it attains. In the absence of proof to the contrary, we are entitled to assume that the degenerative changes accompanying pyrexia commence soon after the first departure from normal, and increase *pari passu*, with its elevation. We should expect, for instance, that a pyrexia of about 103·5° Fahr., lasting for five or six hours, would be as injurious as one of 106° Fahr. for half an hour. If we regard degeneration of the cardiac fibre as the test of the mischief, microscopic investigation would seem to bear this out. In a case of prolonged fever, where the temperature had never passed 103·5°, but had continued over long periods near this point, a condition of degeneration of cardiac muscle was found greater than in a case (of cerebral embolism) where the temperature quickly reached 108°, and was as quickly brought down. An equally suggestive comparison was made in a case of pelvic cellulitis, where there were high evening rises of short duration, and only slight granular changes in the heart muscle. There seems, in fact, to be no fixed point at which degeneration commences.

Our treatment must vary accordingly. If the chart curve for

a day or two previously has shown sharp peaks, we are justified in waiting for a short time to see if a high temperature will not fall of its own accord. But, if the peaks have been broad, if the temperature has shown a tendency to continue high for several hours, we are not justified in waiting for the natural fall. We have nothing here to guide us but the previous course of the temperature, and, with less reliability, the age of the patient.

3. *The Stage of the Disease.*—Towards the termination of the fever the temperature curves are usually sharper; there is less probability of a temperature continuing long very high, and, consequently less urgent demand for treatment. This rule, of course, must be qualified according to the previous course of the disease, and the condition of the patient. The patient's heart may be in very feeble condition from continued or excessive pyrexia in the early part of the disease, and every elevation in the latter end may tell with redoubled force. In such a case extreme care must be taken not to let a temperature continue long at abnormal height.

In the early stages the rule is more simple. Prognosis as to the severity of a case of enteric is almost proverbially uncertain, and we must always treat it in the beginning as if it were to be severe in the end. In other words, we must be careful that the baneful effects of high temperature be not in the end one of the factors in prolonging convalescence or increasing danger.

4. *The State of the Patient*, or the manner in which he behaves under the fever, is perhaps the most important consideration of all. It is in perfect consistence with our knowledge of thermometry during health that there should be varying reactions as to temperature in disease; and it is equally intelligible that a given height of temperature should produce different amounts of evil in different individuals. It is undoubtedly the case that the worst, and most commonly fatal, cases are usually those that have the highest temperature; and, thus far, our conduct is plainly enough prescribed. But seeing that in a goodly number of cases the subjective results of the fever are out of proportion to the objective indications of heat, we may not abide by the thermometric indications alone. The actual extent of the evil produced, as much as the supposed potentiality of the

cause, must guide us in our treatment. That is to say, though systematic treatment is always to be carried out only in cases of severe pyrexia, a moderately high degree of fever is not to be let alone if the symptoms show that it is doing the patient much harm.

In the practical carrying out of the treatment another consideration arises for our guidance. This is a sort of tolerance which we see both of quinine and the bath. With the bath the demand is for increased frequency rather than for increased cold. With quinine the demand is rather for increase of dose. Thus if a patient gets two baths on one day, he will probably, on the same principles of treatment, require three or four next day, and so on. And with quinine, if thirty-five grains have reduced the temperature six degrees on the first administration, forty grains will probably be wanted to produce the same effect on the second. It is seldom, however, that we have to go beyond forty-five grains at one dose; and it is very improbable that there will be any call for antipyretic treatment for twenty-four hours after the administration of quinine.

In conclusion, it is urged that the pyrexia of enteric may be better treated by quinine and the bath, than by the bath alone. Where everything is favourable, and where the demands for treatment are not more frequent than twice or thrice a day, we may rest content with cold bathing. With the aid of quinine we may dispense with the heroism of four hundred baths in the course of one case of enteric, and we need not let a pyrexia remain untreated when failing heart's action or complications such as pleurisy, peritonitis, hæmorrhage, forbid the bath.

If we have formed an honest estimate of the therapeutic value of both methods, and intelligently applied our knowledge in practice, making the one to supply the defects of the other, and both to work their best towards the common end, it will be seldom indeed that we meet with a case of enteric fever whose pyrexia cannot be kept under control.

VASO-MOTOR DISEASES IN INDIA.

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DURING my sojourn in India I have been struck with some remarkably constant characteristics in the men who seem to suffer most from certain diseases common in the tropics. These I have here recorded, together with my own experience as to the most successful modes of treatment in the cases which have come under my care, in the hope that it may stimulate medical men who have more extensive opportunities of studying the European in India and his diseases than I have to record their attempts to cure those maladies which, with their consequents, cause such excessive mortality among us.

The diseases are what are, for the most part, called functional diseases, and have their origin or cause in a weak vaso-motor system. The weak circulatory system has many enemies in the tropics. The climate of India, with a mean temperature of 80°, and the mode of life, necessary confinement during the whole day, and only of a morning or evening a little exercise to be had, are of themselves trying enough. But when it has also to contend against a weak will, whose power over the passions is of the slightest, and by abuse of the luxuries of the country, presses on an already overtaxed organism, that these causes terminate in disease, is not astonishing. The errors in diet, eating the hot dishes and highly-spiced curries, the imbibition of a larger amount of alcohol than required, and especially the excessive use of tobacco, are important factors in producing disease in a man of the following temperament. The weak vaso-motor system is generally possessed by a man with a soft

moist eye, a dilated pupil in a blue iris, and a thick drooping upper eyelid. The nervous system, not well balanced, is easily disturbed by any excitement. The blood vascular system is weak and atonic, as shown by the irregular heart, subject to palpitations and tumultuous action on slight exertion or sudden emotion, the small and irregular pulse, the tendency to dilatations and eventually varicosities of the veins, and the ready congestion of the capillaries on exercise or alcohol being taken. On first arrival in India such an individual takes kindly to the long arm chairs with high foot rests there in use, his feet fly upwards as naturally as the sparks, to render the circulation easier. Another very obvious indication of this temperament is the manner in which the patient is overcome with drowsiness: he seems as if he would never again come to that state of thorough wakefulness necessary for the full activity of his brain. This is due to the weak vaso-motor system being unable to regulate the extra work thus thrown on it by the climate, allowing a determination of blood to the skin, with consequent anæmia of the brain, and sleep. After some time in the country, this drowsiness passes away, but leaves behind it that feeling of oppression, mental weakness, inability for brain work, and the loss of memory which we find in persons of this temperament. At this time, too, the patient begins to feel the organism giving other signs of weakness. He is affected by what I more particularly propose to treat of in this paper, viz. : Functional Disorder of the Liver. I have had no opportunity of seeing a case of sunstroke, but reference to cases recorded seem all to point to men of this diathesis as the victims, or what is the same thing, men who have, by alcoholic excesses, and the accompanying tobacco poisoning, so injured and weakened their nervous and circulatory systems that they are on the same platform with men who have been provided with originally bad ones. That this is the case is, I think, borne out by the fact that a great proportion of the fatal cases of sunstroke take place in the early morning, when the *vis nervosa* is at its lowest.

I will now particularly consider functional liver disorder as observed by me, and give one or two cases with the treatment and *rationalis* thereof. The symptoms are well-known, but I may as well give a *résumé* of them.

The teeth are shelly, and generally decayed to some extent, the tongue is large and covered with a whitish coating, which deepens to a thick yellow at the base, a bitter taste is present in the morning. The appetite varies in different cases. Dyspepsia is a concomitant, with gaseous eructations and flatulent distension of the bowels, constipation, with hard, dry, brown scybalous and scanty motions, which are coated with inspissated mucus. There is a feeling of tenderness in the epigastrium, pain and weight in the right hypochondrium, and neuralgic or rheumatic pains in the right shoulder and arm. On percussion the liver is found slightly increased in size and painful on palpation. The hæmorrhoidal veins are full and itching, or there is prurigo round the anus. The genito-urinary system is deranged, the urine is acid, scalds when passed, and is more scanty and higher in colour than normal, from the presence of lithates and some bile pigment. The circulatory organs are weak, especially the heart, whose action, though regular when at rest, becomes tumultuous when the patient is startled or excited and, after the strain is off the patient may almost faint. The veins are distended and the capillaries are easily congested. The nervous system is also weak. There is a feeling of lassitude and disinclination for exertion, with a dull sensation in the head as if the brain was oppressed and unfit for work. Fits of depression come on, and the pain felt in the region of the liver is watched with great anxiety. The desire for commiseration is great, and the patient will disburden himself to any one. When sleeping the patient lies on his back with his arms above his head, dreams incessantly, and is occasionally the subject of frightful nightmares. The integument is the seat of urticaria and lichenous eruptions. Rheumatic pains are present, but seem more in the fibrous structures of the muscular system than the joints; these are doubtless due to the lithæmia present.

The above described conditions are due to a disordered liver, but the circulatory system and its vaso-motor nervous supply is the primary agent. This feeble vaso-motor system allows dilatation of the intralobular veins, and eventually the capillaries, which press on the proper gland substance of the liver and thus interfere with the performance of its functions. Bile is not secreted in sufficient quantity, and the want of this natural pur-

gative gives rise to the dry, hard, brown, motions. The colour of these might at first mislead one, but their brown colour is quite a different thing from the olive brown of a motion with proper admixture of bile. They owe their brown hue to the action on them of the intestinal juices, for the peristaltic action, from absence of its natural stimulant, passes them on but slowly through the alimentary canal. Probably the abstraction of water by the cutaneous system may have something to do with their hardness. Another point is the position of the patient while sleeping, with his hands thrown above his head, which is another indication of the weak circulation, as in this position the work of the heart is made easier than if it had to pump the blood round the arch formed when the arms are kept by the sides. Occasionally, too, a patient will wake in the night, apparently from no cause whatever; he will find his heart beating away most tumultuously, and he instinctively places his hand over the præcordia, and sits up in bed. Breathlessness on exertion is another symptom which I omitted to mention, but which on occasion of any work is one which quickly excites attention.

Judging from all the above-mentioned symptoms, my opinion as to their causes points primarily to the circulatory and vaso-motor systems as being the defaulters, which being the case our efforts at rational treatment should be directed to improving these, rather than the empirical plan of relieving symptoms. The old round of treatment for this disorder was purgatives, nitromuriatic acid, taraxicum, podophyllin, and mercury. With the exception of the mercurial purgative, I have found these of no use at all. The mercurial purgative does good to this condition, but only temporarily, and is, in my opinion, no more curative than is the blood-letting which eases the dyspnoea of pneumonia. Any purgative, but especially the mercurial, carries off by exosmosis the more watery constituents of the blood, and thus "relieves tension," but, as may be judged by the light colour of the stools for the two or three succeeding days, has done nothing toward restoring the function of the disordered gland. It is probable that in transient and less persistent cases this relief of the veins, and the mild counter-irritation set up, may allow the *vix medicatrix naturæ* to right the organ, but in the majority of cases they are only palliative.

Having adopted the theory that the vaso-motor system was the one at fault, I began hunting about for remedies which would act on it more particularly, the first that suggested itself being ipecacuanha. It was adopted for the following reasons. It has been very highly recommended in hæmorrhages of various kinds, such as epistaxis, hæmoptysis, bleeding from the uterus, and flooding after delivery, the only explanation of its action in these cases being its acting on the vaso-motor nerves. Then again, its well-known action in controlling the blood in the stools of dysentery was another point in its favour. I had heard likewise of a case of obstinate constipation, which my friend Surgeon-major Purdon had been successful in the treatment of, with five-grain doses of ipecacuanha three times a day, after all ordinary purgatives and remedies had failed. This result he attributed to the ipecacuanha causing an increased secretion of bile. When talking of my success with ipecacuanha in this disease to a friend, he told me that Dr. McLean of Netley, had recommended it in hepatic cases, and that even in cases where abscess of the liver had declared itself it had been efficacious in abating it. He used fifteen-grain doses, but as I have only this on hearsay, I cannot vouch for its absolute correctness. I have no doubt that in all stages of congestion of the liver this remedy will be found most powerful, but in the cases I find most common, very much smaller doses than fifteen grains are required. Again, taking into account Owsjan-nikow's demonstration that the centre of the vaso-motor system was situated in the medulla oblongata, although having various other smaller centres throughout the body, it seemed probable that a drug which acted so directly on the medulla, through the pneumogastric, and likewise so specifically on that part, would be a most valuable agent in restoring the lost balance between the dilating and contracting set of nerves of the vaso-motor system.

Another drug which I thought might be serviceable in these cases was colchicum, on account of the lithæmic state of the blood, and also on its reputed cholagogue action.

Digitalis I also tried, but without being able to assign to it any specific action in these cases, although when combined with ipecacuanha it certainly effected a cure in the case in which I tried it.

Bromide of potash, and iodide of potash have enjoyed a reputation for some time as curative in functional diseases of the liver, and from Brown-Séquard's experiments showing the power of contracting the smaller vessels possessed by the bromide, it must I think, act as a correcting agent to the vaso-motor system. Iodide of potass has a strong power over the blood vessels as well, as is seen in cases of aneurism treated by it. An electric current passed from the nape of the neck to the hypochondriac region on the right side acts most beneficially in these cases, which is probably due to the contractile effect on the small arteries throughout the body and increase of blood-pressure, observed by Owsjannikow, when this vaso-motor centre in the medulla was stimulated by electricity.

As for local stimulants, a smart mustard plaster acts with great certainty in removing the feeling of pain or aching in these cases. Of course in cases such as I am writing of, the aspirator is much too severe a remedy to be brought into use, notwithstanding its great use in cases of severe active congestion of the liver.

I append three cases selected from those which I have treated, merely giving the outlines and treatment found successful.

1. A. B., an officer who had been in India for three years and had suffered much from "liver." He was a great smoker, and pretty careful on the whole in his diet and alcoholic imbibitions. He had tried a variety of remedies without benefit, except the temporary one given by a mercurial purgative. He was ordered the following:—

R Pil. Hydrag. gr. j.
Pulv. Ipecac. gr. j.
Ext. Colchici. gr. $\frac{1}{2}$
Ext. Gentian. To make a pill.

one of these to be taken every night at bed-time. After he had taken six, he expressed himself as feeling better than he had ever been since leaving home. Whenever from indiscretions, such as a "big" night at mess, the symptoms returned, they were quickly disposed of by the above pills.

I may state I added the blue pill as an aid to purgation, though these pills do not purge, but give, after being used for

one or two days, a large soft morning motion. The colour changes from the brown to the healthy olive brown seen in India.

The second was a more severe case. C. D., an officer of about three years' residence in the tropics, complained to me one day of having severe pain in the liver, and his urine as dark as porter; there was no jaundice; he had taken purgatives with little effect. The liver was enlarged and most sensitive to palpation, the patient almost fainting on percussion. This yielded to the same treatment, except that I gave two grains of ipecacuanha instead of one. He was well in a week.

The third case, D. D., was that of a Sepoy, who came into hospital complaining of pain in the spleen and liver; both were found very much enlarged, and I ordered him the following:—

R Pulv. Ipecac. gr. 5.
Pulv. Opii. gr. $\frac{1}{2}$.

This powder to be taken three times a day. On the first day he had three motions, and on the second four, after which the pain entirely disappeared from his right side, and the liver diminished in size. Though the spleen slightly decreased I could not consider it due to the ipecacuanha, for I continued the treatment for a week, when it had to be abandoned and quinine and biniodide of mercury commenced.

I will end by giving a short injunction to those resident in India, and especially people of the weak or easily disturbed vaso-motor temperament, that they cut down their alcohol as much as possible. None is best; and eschew that, to them, most pernicious habit of smoking tobacco. Then these small doses of ipecacuanha and colchicum will, when required, keep the system in working order. They are best taken at night, as they do not cause vomiting, and their effect does not disturb the appetite for breakfast.

Reviews.

The Use and Value of Arsenic in the Treatment of Diseases of the Skin. By L. DUNCAN BUCKLEY, A.M., M.D. New York: Appleton and Co. 1876.

THE author has found arsenic valuable in psoriasis, eczema, pemphigus, acne, and lichen. In psoriasis he recommends its continuance for some time after the disappearance of the eruption. In eczema he has prescribed the metal in larger doses than are usually given, and without bad results. A case is reported in which a child of five years took for a long time fifteen drops of Fowler's solution three times a day.

Atlas of Skin Diseases. By LOUIS A. DUHRING, M.D. Part II. Philadelphia: Lippincott and Co. 1877.

THIS part of Dr. Duhring's atlas contains plates of acne rosacea, ichthyosis (simplex), tinea versicolor, and sycosis non-parasitica. They are of the same high standard of excellence which characterises the plates previously published in Part I.

Gunshot Injuries: their History, Features, and Treatment. By Surgeon-General LONGMORE, C.B., F.R.C.S. Longmans: London.

It is not every volume of which it can be said that it has either supplied a want or achieved a success. The work before us, however, has done both. The progress of surgery in the last twenty years has been unprecedented. Yet till Professor Longmore's book appeared there was, to judge by the current handbooks, one department—that of military surgery—which had dropped somewhat behind the times. It seemed as if our confrères, lacking the material for establishing new views, and developing new methods of practice, which a conflict between England and one of the Great Powers could alone afford, had rather slumbered and slept. Our author has, however, come forward, with most fitting opportunity, to put the matter in quite another light, and has shown how thorough are the preparations that have been made by his branch of the service for any turn

affairs may take. At this moment the peace of Europe seems all but assured; but in the past few months, while the clouds were gathering, Professor Longmore must often have felt it doubtful whether he could finish his task and place his book in the hands of his associates before the storm should burst. Now that it is completed, and all in good time, we may at once pronounce it a great success. Henceforth it will take its place, not only as the highest authority on the principles and practice of military surgery, and as the indispensable *vade-mecum* of every military surgeon, but as the source of a large amount of valuable information respecting the equipment and organisation of our army in the field.

The work, which, looked at as a whole, is very complete and comprehensive, is arranged in different sections. Under the head of gunshot injuries and the means by which they are produced we find a concise account of firearms, from their first invention to the present time, and an interesting description of the forms that are now in use, of the projectiles they carry, and the charge of powder they require; especially interesting are the chapters on the rotation and velocity of the different projectiles, and the author's remarks on the treacherous damage often inflicted by "spent shot." Some remarkable examples of the toughness of the human skin are given, from which we may quote the following:—"At the battle of the Alma a round shot pitched on the ground, twenty yards in front of the first line of a firing party, and bounding on, struck Private C. in the abdomen, killing him instantly. The body when raised was observed to be very heavy, and the shot, a 24-pounder, was found lying in the abdomen. The ball had entered through a short linear slit, and the skin of the back was not in the slightest degree broken, but the spine was ground to pieces and pushed aside with a mass of other disintegrated parts." Next follows an instructive section on the characteristic features and distinguishing signs of gunshot injuries, and then chapters on pain, shock, hæmorrhage, and other symptoms; and a grim account of the lodgment of projectiles and other foreign bodies. During the Crimean war Professor Longmore's distinguished colleague, Surgeon-Major Porter, had under his care an officer with a large wound in his thigh, inflicted, as the patient thought, by a ramrod which he was carrying in his hand. A few days later an abscess formed, and from its cavity Surgeon Porter removed a long fragment of the thigh-bone of a soldier who had been killed in front of the officer. In another case two five-franc pieces were found imbedded in a patient's thigh, but he declared he had no money about him when he went into action, and he had no pocket in his trousers. It proved the coins had been shot away from a comrade who was fighting by his side.

Secondary complications of gunshot wounds, gangrene, secondary hæmorrhage, tetanus, &c., are discussed, as are also the ulterior consequences, as, for example; the after effects of injuries of nerves, and of the spinal marrow, hernial protrusion, and deformities due to cicatrization of large wounds. Then follow some highly interesting chapters on the first help to the wounded, including assistance while the action is in progress, aid at dressing stations, clearing of the field after action, attention to hæmorrhage, and the treatment of wounded men on their arrival at a field hospital. In respect to the examination of wounds, search for foreign bodies and methods of their extraction, all that is said bears the stamp of careful observation and ripe experience.

The concluding portion of the work deals with the statistics of gunshot injuries in warfare, a subject which the author has long and closely studied, and which he has here treated with conspicuous ability. Inspector-General Taylor's tables are printed in blank, and various suggestions for their improvement are thrown out. With these as a framework the medical department, proceeding on a scientific and carefully matured plan, will be enabled, in any future war, to furnish, with moderate labour, efficient and comprehensive returns of the injuries and losses sustained by our army in the field. After these tables comes an elaborate historical account of the casualties of war from Blenheim to the end of the Franco-German campaign. Here is material, not only of profound interest to the student of the past, but of great value to those with whom rests the future of our military system. Our space does not allow more than a mere reference to this important contribution to military surgery, the value of which as a work of reference is greatly increased by an extensive and accurate index. We will only repeat, in closing this notice, our congratulations to Professor Longmore on the success which he has achieved in the production of this work. We may also congratulate the profession which he adorns and the army which he has so long and so faithfully served.

The Pathology and Treatment of Membranous Dysmenorrhœa.—

By JOHN WILLIAMS, M.D., Assistant-Physician to University College Hospital. (From Trans. Obst. Soc. vol. xix.)

THIS paper is the work of an accurate, honest, and healthily sceptical observer. It deals with a painful and most intractable malady, sufficiently rare to be interesting on that account, but sufficiently common to cause womankind a great deal of suffering. None of the cases recorded can be said to have been cured, but scientific knowledge of a malady is the first step towards its cure, and it will be hard if such a careful inquiry as that before

us should remain eventually fruitless. Meanwhile it is something to know the remedies which have been tried and found wanting.

On the Treatment of Rupture of the Female Perineum—Immediate and Remote. By GEORGE GRANVILLE BANTOCK, M.D., F.R.C.S., Edin., Surgeon (for In-patients), Samaritan Free Hospital for Women and Children. Churchill. 1878. Pp. 51; plates 5.

THIS is a good practical paper, and worth the perusal of those who have to deal with perineal-rupture. We thoroughly agree with the writer on the importance of immediately dealing with the lesion in all cases where the tear is anything but very slight. Treatment by non-intervention is indeed easily carried out, but the consequences are apt to be disastrous, and to entail a largely increased amount of inconvenience or suffering, while all that can be urged in its favour is comprised in the perpetually repeated statement that operation is generally unnecessary. We suspect that the "personal equation" has a good deal to do with this, for it is not so easy to satisfactorily repair a badly ruptured perineum by immediate operation as is generally thought.

Dr. Bantock is at times somewhat sweeping in his statements, and his description of the operation would have been better if a little more detailed.

The simplicity of Dr. Bantock's method is much in its favour, and we can quite endorse his refusal to have anything to do with quilled sutures, or lateral or anal incisions, all of which are unnecessary, and more than one barbarous.

His remark (p. 32) about the unnecessary length of new perineum often manufactured is also much to the purpose. We think that surgeons who thus unnecessarily display their skill, should be obliged to deliver their patient in her next confinement.

We might suggest one improvement on the title-page where the author describes himself as a surgeon *for in-patients*. Surely no one needs reminding that Dr. Bantock did not perform his operations in the out-patient room.

ERRATUM.

We regret that by an error in the review of Dr. McKendrick's *Outlines of Physiology*, which appeared in the June number of the *Practitioner*, the publisher's name was erroneously printed James Maclure instead of James Maclehose.

Clinic of the Month.

Retention of Urine in the Female.—Dr. J. H. Croom of Edinburgh groups the causes leading to retention of urine in the female in the following order. 1. Injuries or contusions during labour acting directly or by subsequent inflammation. 2. Pressure of displacements or tumours acting mechanically on urethra or neck of bladder. 3. Injuries or growths acting reflexly. 4. Diseases of the nervous system. 5. Direct obstruction within the tube of the urethra as from stricture or foreign bodies, such as a calculus. He considers the following points to be worthy of note. 1. In all cases of retention of urine a vaginal examination is necessary. 2. A gum elastic male catheter of medium size without the stilette is the best form to employ. 3. In retention from displacement it is important to remember the altered position of the urethra. In retroversion of the gravid uterus, the vagina is drawn upwards and forwards, the meatus is drawn upwards, and the direction of the upper part of the canal is backwards and downwards. 4. When any difficulty exists in accounting for the retention a visual examination should be insisted on. 5. It is a safe rule, before giving a definite verdict on any pelvi-abdominal tumour, to empty the bladder. (*Ed. Med. Journal*, May, 1878.)

Ergot of Rye in the Treatment of Polyuria.—In a case reported by Dr. Rendu the polyuria was accompanied by supra-orbital neuralgia, vertigo, with loss of consciousness, excessive thirst and hunger, with emaciation and loss of strength, although the patient consumed a considerable quantity of food. The urine contained no trace of sugar, the quantity was about ten quarts a day. The urea eliminated by this means in the twenty-four hours amounted to from about 1,250 to 1,400 grains. Before having recourse to ergot of rye, tincture of valerian was first tried for this patient, in the dose first of fifteen minims, and soon after of half a drachm. Under the influence of this treatment, the urine diminished by nearly a quart. Sulphate of atropine in the dose of one milligramme (·015 grain) at first,

then two daily, produced a similar improvement; but no advantage was found in persevering in this course, since the appetite diminished with the valerian, and the thirst increased with atropine. Ergot of rye was then tried, and the success with this agent was remarkable. In eight days the urine fell to fifteen grammes in the twenty-four hours, the emaciation was stopped, the strength returned, whilst the thirst and the excessive desire for food also disappeared. (*British Medical Journal*, April 13, 1878, and *France Medical*, February 27, 1878.)

Treatment of Diabetes Insipidus with Ergot.—Dr. A. Costa reports a case of diabetes insipidus with the excretion of ten pints of urine daily, with sugar or albumen, marked by great emaciation, and states that he treated the patient with fluid extract of ergot, which treatment had been followed by complete cure in two cases in private practice. The patient was first put on an initial dose of half a drachm of the fluid extract thrice daily, the dose to be increased gradually, first to one drachm, and then to two drachms. There was at once apparent a great reduction in the quantity of urine passed daily. From ten pints it fell to six pints daily, then to three, where it remained. Even before reaching the present limit, the dose was ordered to be gradually reduced, first to one drachm then to half a drachm; then it was stopped altogether and mint-water substituted in its place. The patient was considered permanently cured; the amount of urine daily passed varied between two and three pints. (*New York Hospital Gazette*, February 15, and *British Medical Journal*, April 13, 1878.)

The Bael Fruit and its Medicinal Uses.—Sir Joseph Fayrer states that the evidence which he has obtained shows that bael is a remedy of much value in chronic dysentery, but is useless in the acute forms. In the chronic condition of dysentery into which the bowel is apt to pass, when it is thickened, perhaps ulcerated, and indurated from cicatrisation, and subject to frequent recurrence of sub-acute inflammation and dysenteric action indicated by pain and the discharge of mucus and blood, and when the entire mucous membrane is sympathetically involved, the use of the fresh bael taken in the form of sherbet is likely to prove of service. It will not always alone be effective, and it may be necessary to combine it with other remedies, such as opium or Dover's powder; but as an adjuvant to these or to astringents it may be useful, and from the power it possesses of giving tone to the alimentary system generally, of improving the condition of the mucous membrane and its glandular apparatus, and of favouring cicatrisation it will not unfrequently aid in producing satisfactory results where other remedies have failed. (*Med. Times and Gazette*, June 15, 1878.)

Causes and Cure of Insomnia.—Dr. Sawyer observes that insomnia is one of the commonest complications and consequences of a vast variety of morbid states. Pyrexia, physical pain, coughing, dyspnoea are all conditions which prevent or shorten sleep. Such insomnia may for the most part be controlled either by the exhibition of remedies which directly promote sleep (hypnotics), or by the adoption of measures which combat the cause of the insomnia, by reducing fever, by palliating the pain, by checking cough, or by relieving cardiac disturbance. But there is another form of sleeplessness, which may be called *insomnia per se*, or simple inability to sleep, for which it is difficult to find an adequate cause, but which seems to depend on inability on the part of the brain and nervous system generally to adapt themselves to the conditions that are requisite for sleep. It is more common in the upper middle class than amongst others, and especially in those of high mental endowment. There are, he thinks, three varieties of this form, psychic, toxic, and senile. In natural sleep the brain is anæmic and inactive, hence any cause that prevents due repose of a sufficient number of the cerebral cells, or sustains cerebral hyperæmia, will prevent sleep. Examples of psychic insomnia may be found where severe and sudden emotional shocks or prolonged mental strain affect men of nervous temperament. The patient is dull and listless, the eyes wanting in vivacity, complexion sallow, headache is present with occasional giddiness and disturbances of the senses, twitchings of the muscles. In toxic anæmia the cause of the sleeplessness acts primarily upon the vessels of the brain, giving rise to some degree of arterial hyperæmia. The external poisons thus acting are tobacco, alcohol, tea and coffee, the internal, are certain effete products of tissue metamorphosis which accumulate in the bodies of gouty patients, or of those whose kidneys act deficiently. The insomnia of these cases he believes to be due to the maintenance of a state of high tension in the cerebral arteries. In the senile form of insomnia the sleeplessness is due to senile degeneration of the smaller cerebral arteries, which are physically unable to adapt themselves to the condition of relative arterial anæmia, which is requisite for healthy sleep. In the treatment of insomnia soporifics must often be used. Of these the chief are chloral, opium, morphia, the bromides, Indian hemp, alcohol, and affusion with cold water. In psychic insomnia Dr. Sawyer prefers chloral. Change of air and scene and rest are essential. In the well-nourished, bromide of potassium is the best hypnotic, in 30—60 grain doses, combined with tincture of ergot or of digitalis. Overworked men are often anæmic, and require iron, with a little alcohol, at night. Exercise may generally be enjoined. In gouty lithiasis, with a pulse of

high tension, he has confidence in the curative effects of colchicum, supplemented by the use of dilute saline purgatives, such as Pullna, Friedrichshall, Hunyadi Janos, or Rakoczy waters. Senile insomnia is very obstinate, but perhaps in the bromides, with full doses of hops or henbane, we have the best and least harmful means for its relief. (*Lancet*, June 15 and 17, 1878.)

Cholecystotomy in Dropsy of the Gall-Bladder.—Dr. Marion Sims gives an interesting case of a lady, previously in good health, who suffered a mental shock. Soon after pain in the right lumbar region was experienced, and in the right hypochondrium; then suddenly became deeply jaundiced; a swelling was noticed at the lower border of the liver, and she had several sudden discharges of clear uncoagulated blood from the bowel. Perchloride of iron was given. Intense itching of the skin and lancinating pains through the joints succeeded. The tumour grew; and Dr. Sims, in conjunction with others, diagnosed dropsy of the gall-bladder, or cyst of the liver, and aspiration was recommended; which being done, thirty-two ounces of a dark brown fluid were evacuated, which contained neither bile nor hydatid hooks. The evacuation of the fluid relieved pain, and sleep was obtained. Soon, however, itching recommenced, and she had a fainting fit. The tumour reappeared, and was very sensitive. It was agreed to cut down upon it, empty its contents, and attach its incised border to the edges of the abdominal incision, and thus to make a fistulous opening. Ether was given, and the operation performed with antiseptic precautions: twenty-four ounces of fluid were evacuated, and half-a-dozen gall-stones. She went on fairly well for about four days, when hæmorrhage took place of dark bloody fluid from the wound and from the gums, and death occurred on the ninth day. After death numerous gall-stones, all sacculated, were found, which after examination showed to be chiefly composed, as usual, of cholesterine. The gall-bladder was greatly dilated, as were the bile-ducts. The mucous membrane of the stomach and small intestines were pearly-white, but contained a coffee-ground fluid. As a conclusion to be drawn from a retrospect of the case, Dr. Sims proposes that whenever we have persistent jaundice, with clay-coloured stools, nausea, and intense itching of the skin, we may take it for granted that there is mechanical obstruction of the gall-ducts, and it is our duty to open the abdomen and search for the gall-bladder as soon as we can detect any swelling in the region of the liver. If we have been mistaken in the diagnosis, then a simple exploratory incision only has been made, which, under antiseptic conditions, is devoid of danger. Again, this proceeding is applicable in cases of suspected abscess of the

liver, which organ can then be minutely explored, and if fluctuation can be discovered a Dieulafoy trocar can be introduced, and the abscess evacuated.—(*British Medical Journal*, June 8, 1878.)

The Administration of Iron and Cod-Liver Oil.—Dr. G. F. Elliott, of Hull, observes that the desirability and at the same time the difficulty of giving iron and cod-liver oil simultaneously must have been experienced by every member of the profession. The difficulty consists in the circumstances that if any of the commonly-used preparations of iron, such as the syrup of the iodide, or the tincture be in any way mixed with cod-liver oil, the well-known and nauseous flavour produced by the contact of steel and fish is strongly developed; and, on the other hand, if they are given separately the patient complains that he is always taking medicine. Dr. Elliott finds in the new preparation (solution of dialysed iron) a very satisfactory means of overcoming the difficulty. The oil should be poured on the vehicle in which it is usually taken, and the requisite dose of the iron solution should then be carefully dropped upon the surface of the oil, and it will be found to remain suspended in the latter, neither sinking through into the liquid below, nor becoming decomposed in any way. The iron solution being as nearly as possible tasteless, its addition is in no way objectionable to any patient who can tolerate the oil. (*Lancet*, June 22, 1878.)

The Microphone as an Instrument of Diagnosis.—In a lecture delivered in University College Hospital Sir Henry Thompson exhibited a microphone, which he had directed to be constructed, and had successfully employed in the recognition of stone in the bladder. He pointed out that the surgeon must still rely largely upon the delicacy and sensitiveness of his own manipulation; but thought that occasionally the instrument in his possession might prove serviceable by rendering absolutely certain the existence of small fragments in the bladder. (*British Medical Journal*, June 8, 1878.)

Therapeutic Note on Hydatids.—Dr. Norman Cheevers observes that, many years ago, he saw a considerable number of cases of hydatids in London, and it was at that time rather frequently noticed in the post-mortem room at Guy's that nature appears to have a very summary mode of killing the parasites, and thus of effecting a spontaneous cure. As the cyst enlarges a minute bile duct is opened, and bile escapes into the cavity; the fluid is absorbed, the cyst undergoes gradual and very great contraction and often cretaceous deposit, and the dead and empty parasites are closely compressed into a solid laminated mass, markedly stained throughout by yellow pigment. Dr. Cheevers states that he intended, but had no

opportunity, of trying this hint from nature in India. It might, however, be worth trying. (*Medical Times and Gazette*, May 18, 1878.)

The Use of Thymol in Surgery.—The employment of thymol in surgery as a substitute for carbolic acid is a natural consequence of the discovery of its greater antiseptic and less septic power. Ranke uses a solution containing one part of thymol, ten parts of alcohol, twenty of glycerine, and a thousand of water, which can be used either as a spray or as a lotion. He also uses gauze impregnated with it, and as thymol does not irritate a wound it may be applied directly to it; otherwise, the same method is employed as in Lister's plan. If the gauze become hard and dry it may be moistened once or twice a day with thymol water. In order to prevent the evaporation of the thymol from the dressing the gauze is covered with oiled paper. From an experience of forty-one cases Ranke concludes that the method leaves nothing to be desired in regard to its antiseptic effect, and that it answers better than the carbolic acid dressing, since the secretion from the wound is less, the period of healing shorter, and the cost of the dressings smaller. Further, it has no poisonous properties, and eczema was never observed as a result of its use. (*Lancet*, June 22, 1878.)

The Diagnosis of Adhesions in cases of Abdominal Tumours.—Mr. Spencer Wells, in his second lecture on abdominal tumours, delivered at the College of Surgeons, remarks that practically the question of extent of adhesion to the abdominal wall is not of much consequence. The result is nearly the same to the patient, but the amount and intimacy of *pelvic* adhesions are matters of very much greater moment. Supposing an ovarian cyst is adherent low down in the pelvis, between the uterus and rectum, or the uterus and bladder, or on either side, the attempt to separate it is necessarily a dangerous one. If any blood-vessels be torn it is difficult to find them, and although by artificial means a strong ray of light may occasionally be thrown to the bottom of the pelvis, and a bleeding vessel secured, yet this is a troublesome and difficult proceeding, and the results of these cases are by no means so satisfactory as when there are only adhesions to the abdominal wall. Such adhesions as the former may be pretty well ascertained by a careful examination of the pelvis by the vagina. The tumours do not move with the position of the patient, nor when she coughs, nor when the shoulders are lowered and the hip raised; and it is impossible, either with the uterine sound, or in any other way, to separate the uterus from the pelvic portions of the adherent tumour. Occasionally an ovarian tumour low

down in the pelvis will be met with which does move, from which the uterus can be separated, and need not interfere at all with ovariectomy; but if there be intimate adhesion pretty low down, the operation is not one that is likely to succeed. (*British Medical Journal*, June 22, 1878.)

Successful Treatment of Rabies.—Dr. Nichols, of Chelmsford, records an interesting case of a carter, who was bitten in the leg by a small stray dog, whose history cannot be traced. A fatal case had occurred in the town near which this took place, and several dogs known to have been bitten were still at large in the neighbourhood. The bite was through a thin white stocking above the boot, the trousers at the time being tucked up. Blood flowed, and the wound smarted. The wound healed, and he thought no more about it till the 7th of March, seven weeks after the accident. He had never seen or heard about any of the symptoms of hydrophobia. On the 7th March he felt very tired, and aching in both legs, and on the following day all his body ached, and his appetite failed. On the 9th he refused a glass of beer, saying he could not drink it. On the 12th he was irritable, restless, drowsy, and extremely thirsty, drinking through the day six or seven pints of coffee, taking no solid food, and complaining of the slightest noise. On the 11th he was unable to drink, and, driving his cart furiously, lost consciousness. On the 12th Dr. Nichols saw him in a fit lying on the floor, with furniture broken around him, legs tied, and struggling furiously. His countenance was livid, jaws clenched, cold perspiration on brow, pulse low, and respiration slow and laboured. He was uttering a peculiar noise, suddenly became sick, and consciousness returned; but he soon relapsed, chloroform was administered, which quieted him, and its action maintained almost throughout the day, spasms and opisthotonos of a very marked character frequently recurring. At night it was agreed to try a hypodermic injection of calabar bean and morphia. Accordingly twenty minims of Corbyn's solution of the latter (1 gr. ad ℥. vi.), and one-third of the extract of calabar bean in solution, were injected. During the night he slept several times, but on his awakening the convulsions invariably recommenced, and the attendants at once administered chloroform until again quieted. On the 12th there were subdued tetanic convulsions of all the muscles, and the same injections were repeated three times during the day. He swallowed small quantities of food. On the 13th the urine, which had not been passed from the commencement of the attack, was drawn off with a catheter; it was moderate in quantity and quite healthy. On the 14th ten grains of calomel was placed on the tongue, and an injection given per rectum of castor-oil, gruel, and

turpentine, without result. Any white object on being seen induced convulsions. On the 15th the morphia injection and the purgative injection were repeated—the latter without result; but he became conscious. On the 18th the bowels were relieved for the first time; but strong convulsions occurred at night. During the 20th, 21st and 22nd a single injection of morphia *per diem* kept him quiet. On the 23rd no injection was required, and he recovered without further treatment. On the 26th he walked into the garden, and on the 14th May was at work in the garden, feeling quite well, but rather weak. (*Lancet*, June 15, 1878.)

Treatment of Acne Rosacea.—Mr. James Startin finds vegetable acids, mineral waters, purgatives, arsenical preparations, and mercurials are not indicated in this skin eruption. The diet should be carefully regulated; little or no stimulant should be allowed except in those cases where the power of digestion may require slight stimulation or excitation to perform their proper functions, and he considers the discriminate use of chalybeates combined with mineral acids, vegetable bitters, and tincture of iodine, to be the most useful internal remedies. The benefit to be derived from them is considerably augmented by the sulphur vapour douche or bath. The external treatment of acne is however most important. If at the onset of the disease the sebaceous glands and follicles become affected and overloaded, they should be relieved by pressure between the finger and thumb-nail or by a large watch-key, and by frequent washings with warm water and oatmeal, after which a good rubbing with a flesh-brush will remove the contents of a number of pimples. If the disease be more advanced, and the indurated spots become enlarged and painful, the vapour douche is of much service, followed by an ointment of ammonio-chloride of mercury (30 grs. ad. ℥i.), and camphor one ounce, or the gentle application of iodide of sulphur ointment at night, and the use of a cooling zinc lotion of calamine and glycerine (of the former about ℥ ii. of each to 1 oz.) to be painted over the part affected two or three times a day. In regard to the small indurations and superficial venous enlargements that so frequently remain, Mr. Startin recommends the application of the strong acid nitrate of mercury with care by means of a spun glass brush. One or two applications with the immediate use of blotting paper will usually suffice to effect a complete obliteration of the veins without a scar. Some of the larger vessels may however still remain, and thus the mercurial acid treatment is not effective. To obliterate these he divides each engorged superficial and conspicuous vessel with the point of a lancet, and if there be much hæmorrhage applies a small ring of silver

or steel about the eighth of an inch in diameter over the vessel ; he then inserts a minute grain of nitrate of silver upon the end of a probe which at once stops the bleeding and soon obliterates the engorged vein, leaving only a small black discoloured spot which may easily be removed by the application of a solution of potassium iodide. An M.D. writing in the same Journal recommends the adoption of good general regiminal measures, the application (not infraction) of oleate of mercury to the face morning and evening, each application being allowed to remain on until time for next, then to be washed off with a little glycerine soap, the face being bathed meanwhile for about ten minutes in warm water. Constipation may be removed with confection of sulphur or senna, and dyspepsia with alkalies, bismuth, and pepsine. (*Lancet*, June 22, 1878.)

Extracts from British and Foreign Journals.

Treatment of Goitre.—Within the past eighteen months some twenty-five cases of this very interesting disease have come under the notice of Dr. Roland Curtin, Chief of the Medical Dispensary Staff. Twenty-four out of the twenty-five have occurred in women, and in most cases have been intimately connected with some uterine trouble. The successful mode of treatment has been by hypodermic injections of from six to ten minims of a solution containing ninety-six grains of ergotina to the ounce of distilled water. The injection is repeated two or three times a week, for the space of from four to six months, when the gland becomes thoroughly hardened. The gland begins to shrivel with the stoppage of the injections and very soon returns to its normal size. Ergotina is of no value in bronchocele, but only in cases of simple enlargement of thyroid gland. The injection is attended with very little pain, which pain is generally local, or referable to the origin of the sternocleido-mastoid muscle. (*The Medical Record*, No. 335.)

Galvanisation of the Cervical Sympathetic in Exophthalmic Goitre.—Dr. D'Ancona relates the case of a woman, aged nineteen, suffering for two years from exophthalmic goitre; the usual train of symptoms being well-marked. In spite of all kinds of treatment, she had arrived at such a stage of cachexia that her life was despaired of. At length galvanisation with ten elements of Stöhrer's portable battery was tried, and on finding it was rapidly followed by signs of amelioration, it was persevered in for five months. During this time, one hundred seances, lasting from three to five minutes each, were given to the patient. She gained thirty pounds in weight; her face lost its paleness, and regained its natural colour; the exophthalmos disappeared almost completely, as well as the enlargement of the thyroid body, and the pulse fell from 130 to 90. Menstruation was restored, and in every respect the health of the patient was entirely re-established. (*Gaz. Med. Ital. pro Veneto, and Dublin Journal*, Feb. 1878.)

Sciatica Treated with Electricity.—Dr. Crapols gives the details of a case of sciatica occurring in a young woman aged 23, of highly nervous constitution, but otherwise in good health. She was married, had had a miscarriage, and was in the fifth month of her second pregnancy when she suddenly experienced pain in the region of the left sciatic foramen, proceeding down the thigh, which, increasing in intensity, was diagnosed as neuralgic sciatic. Various remedies, as opium, morphia, sinapisms, veratria, and chloroform, ointments and liniments were prescribed without material benefit being derived from them. Delivery at length took place nearly at the normal time, but the sciatica continued with equal if not increased severity. There were four painful points; one at the point of emergence of the nerve from the pelvis, a second in the middle of the outer part of the thigh, a third in the popliteal space, and a fourth in the plantar region of the foot. Signor Crapols determined to try the effects of the constant current. Fourteen elements of a Bazzano's pile constructed for him by Dr. Gasparoni were first applied, and then twenty-one. The duration of each sitting was fifteen to twenty minutes at first and three quarters of an hour at last. For eight days no improvement occurred, but after that it was rapid, and on the 22nd she was well. (*L'Imparziale*, No. 18, Anno xvii.)

Nitrate of Lead in Epithelioma and in Onychia.—G. Calletti states that he has recently effected a cure in three cases of epithelioma, in one of which the part affected was the nose, in a second the cheek, and in a third the sternum. The mode in which he applied the remedy was by dusting the powder over the affected part, and recovery took place when this had been done about four times. Two obstinate ulcers of the foot which had proved rebellious to other methods quickly recovered under the same treatment. Vanzetti has recently recommended the use of the nitrate of lead in onychia maligna. (*Raccoglitori Med.*, 1877, No. 9.)

New Method of Compression of the Iliac Artery in Amputation at the Hip-Joint.—Mr. Richard Davy of the Westminster Hospital remarks that in all severe operations one of the first considerations of the surgeon is to anticipate shock and to prevent the loss of blood. He accordingly permits a patient to have a glass of wine or brandy and water about an hour before the operation, with a result that partakes more of a sedative than of a stimulant character; apprehension is assured; cardiac tone is gained; fitness for the ordeal is exhibited. The American surgeons devised pressure on the aorta for hæmostatic ends during amputations high up towards the pelvis. Lister arranged a horse-shoe clamp and screw-pawl for compressing the

aorta above the umbilicus. Dr. Davy saw this mechanism employed in Syme's operation on gluteal aneurism in 1860, and in 1874 he drew Mr. Holmes' attention, who was then lecturing at the College of Surgeons, to the possibility of controlling the aorta, common iliacs, and internal iliacs, by pressure through the rectal wall, which he considers a less serious procedure than compression of the aorta through the abdominal wall. Last January a favourable case presented itself for testing the value of the suggestion in a boy suffering from morbus coxæ, and requiring amputation at the hip-joint. In the performance of the operation the right leg and thigh were emptied partially of blood by Esmarch's bandage, chloroform was administered, and about one ounce of sweet oil was injected into the empty rectum. A straight lever of wood (run smooth and round out of a lathe) was introduced *per rectum*; the small end was applied over the right common iliac artery between the bodies of the lumbar vertebræ and psoas magnus muscle; the projecting part of the lever ran nearly parallel to the left thigh. Mr. Bond readily compressed the common iliac artery by elevating the projecting arm of the lever, the perinæal tissues acting as a fulcrum. As the lever was raised or depressed, so did the right femoral artery cease or continue to pulsate. The left femoral was undisturbed, beating with regularity throughout. A long square anterior flap was made by transfixion over the joint, the muscles and capsule were divided and a short posterior cut severed the limb. The arteries were tied, sutures inserted, and the boy placed in bed. About a wineglassful of blood was lost. The boy recovered, with the exception of one or two small sinuses. (*Brit. Med. Journ.* May 18, 1878.)

Large Doses of Lime-Juice in the Treatment of Rheumatism.—Dr. A. H. Chandler calls attention anew to the use of this old remedy, and reports several severe cases in which good results followed its use. Without regard to the condition of the bowels—unless previously much constipated—he begins with at least ten ounces of lime juice, increasing rapidly to eighteen or twenty-four per diem—from half-an-ounce to one ounce or more every hour, with not less than double or treble the quantity of cold water, usually diluted and sweetened to the patient's taste. He finds that even on the second day the amendment is decided, and the disease, in acute cases, more particularly sthenic or asthenic, generally subsides on the fourth or fifth day of treatment. He usually prescribes one grain of opium, with or without lead and tannin, night and morning, in order to restrain the bowels which the juice has a tendency to relax. The effects of this treatment are, he says, rapid diminution of joint swelling, diminished perspiration, steady fall of

pulse, which often becomes quite slow with a slight tendency to syncope, the majority of cases requiring quinine and supporting food about the sixth day. (*Canada Lancet*, Vol. x. No. 3.)

The Action of Morphia.—M. Calvet of Paris has published recently a physiological research of the action of morphine upon the various functions of the organism; and a clinical study of morphine as a therapeutical agent, especially in the relations of acute to chronic morphinism. In the first, he observes that both intravenous as well as subcutaneous injection of the hydrochlorate of morphine accelerates respiratory movements, succeeded by a period of retardation, and produces sometimes a momentary arrest or respiratory syncope. The same relative effects occur with the cardiac movements: at first accelerated, followed by retarded pulsations; sometimes even cardiac syncope. During this time animal heat exhibits analogous phenomena, namely, the elevated is followed by lowered temperature. In fact, the absorption of morphine, whether by intravenous or subcutaneous injection, produces a very marked influence upon the reflex actions. In certain cases the period of exaltation does not occur, but immediately after the administration of the drug the temperature becomes lowered, and the respiratory and cardiac movements are slower. Though he has not finally completed his researches, M. Calvet advances his opinion, "that the above phenomena are dependent upon the integrity of the connection between the pneumogastric nerves and the encephalon, for if these two nerves are severed the above-named effects do not occur, but only the ordinary sequelæ observed after this section." In the second portion of this thesis M. Calvet offers the following interesting observations on chronic morphinism. Nutrition is deranged, the animals becoming emaciated; for instance, an animal which had received during a month a total amount of 3.52 grammes (twenty-five grains) of hydrochlorate of morphia lost almost half its weight, became torpid, had dilated pupils, and walked with a jumping step, as if he had exalted sensation in the plantar surface. In this and other animals the secretions of saliva and urine were very much diminished; they died more often from marasmus or defective nutrition, but sometimes from convulsions as well-marked as those which are observed in poisoning by strychnine. The anatomical post-mortem lesions observed in these cases were in the arterial encephalo-medullary region, and apoplexy in the vessels of the heart and stomach. Morphine was found in all the organs of the body, but not in the saliva or urine. (*Boston Med. and Surg. Journal*, Sept. 20, 1877.)

Treatment of Leprosy by Gurjon Oil.—The following extract is from a Medico-topographical Report on the Andaman

Islands by Surgeon-Major Hodder, M.D., Army Medical Department.—Whilst speaking of the diseases of convicts, I wish to mention two novel modes of treatment, which, through the kindness of Dr. Dougall, Madras Medical Service and Senior Medical Officer, Port Blair and Nicobars, I have been able to see, and though not connected with the European detachment I think should not be omitted in a report of this kind. The first relates to the treatment of leprosy by gurjon oil—the oleo resin obtained from the *Dipterocarpus Levis*, which grows abundantly all over these islands and in Burmah. When Dr. Dougall first visited the Leper Ward in March 1873, he found twenty-four patients, many in a wretched state, with ulcers, portions of toes gone, anæsthesia, and all symptoms of leprosy clearly defined. He was much impressed with their wretched state and after thinking the matter over for a while decided to use the gurjon oil—one part to ten of cocoa-nut oil as an external application. This was begun, on the 23rd May, 1873, on all the lepers, their bodies being rubbed all over with the oil. In June the proportions were altered to one to five respectively, and shortly after the gurjon oil was ordered internally also in six-drop doses and gradually increased to sixty drops. In July, Dr. Dougall noticed that the lepers were improving in appearance and gaining flesh, and the sores were beginning to heal. He then photographed them for future comparison. The first notable improvements were the healing of ulcers and gradual diminution of the anæsthesia. Not satisfied with the way the gurjon and cocoa-nut oils mixed, Dr. Dougall, in trying various vehicles, hit on lime water, and found that this and the gurjon oil, in the respective quantities of three and one, and violently agitated, formed a substance like soft butter, and this he named “gurjon oil ointment;” it is smooth, and no pain follows its application to the healthy skin. At the same time he made an emulsion of equal parts of the oil and lime-water, for internal use, in half-ounce doses, morning and evening. The following is now the plan of treatment adopted. The lepers turn out at daylight, go to a stream, thoroughly wash themselves, using powdered earth as a detergent; they then return to their ward, receive their dose of emulsion, and then rub their whole body with the ointment. This process should continue two hours, and they are supervised during this time; no limit is placed on the quantity of ointment. At 3 p.m. the dose is repeated, and the rubbing process again gone through for two hours. Dr. Dougall attributes much good to the prolonged rubbing, not only on account of the physical exercise it entails, but the mental occupation it supplies. The emulsion acts as a laxative and diuretic. Twenty-four lepers have been treated and in every case decided benefit has resulted; every ulcer has healed, and

anæsthesia is markedly removed, and tubercles have softened and disappeared. Through the above treatment, men who for years have only dragged on a miserable existence, are now able and willing to work, and the healed sores show no tendency to re-open. No change whatever was made in their diet, which was and is bad. The second mode of treatment referred to is that of ulcers by dry earth in a powdered state. Many of the convicts who work at the clearings are so saturated with and weakened by malaria that the slightest scratch inflames and sloughs, leaving a large, foul-smelling, brown, unhealthy-looking ulcer. Dr. Dougall has treated such cases, with the best result, by means of dry earth. The ulcer is washed, and then the powdered earth, to the depth of about an inch, is placed directly on it and a little over the margins; moist sheets of paper are placed over this, and a bandage over all, and left for twenty-four hours; the earth is then washed off by means of a stream of water, and fresh earth applied. Some smarting results, as the earth seems to act as a stimulant as well as a deodorant. Very soon the brown surface disappears, and all smell is at once removed, and healthy granulations spring up. As soon as this takes place, the ulcer is dressed with carbolic acid lotion, and heals quickly. Dr. Dougall has treated very large numbers in this manner, and is entirely satisfied with it. He mentions that whilst serving in the West Indies in 1868, he treated several large ulcers in the groin, the result of syphilis in soldiers of a West India regiment, with dry earth, and considered that the ulcers rapidly cleansed under the treatment. He had no opportunity of carrying it out except in a few cases." (*The Canada Lancet*, Vol. x. No. 1.)

Chronic Saturnine Poisoning treated by Electricity.—

P. M. Semmola proposes to treat chronic saturnism by eliminating the poison from the system, and basing his views on the property that the electric current has of rendering the molecular changes in the system more active, considers that beneath this augmented physiological activity a movement of disassimilation and of elimination of the lead ought to take place, inducing a radical cure. He adopted this plan in his Incurable Ward at Naples, using a Wollaston's battery of eight elements, placing the positive pole on the tongue of the patient with a moist electrode, and the negative pole, consisting of a plate of copper, on the epigastrium, the current being maintained for ten minutes at a time, gradually increasing to forty minutes, with a few minutes occasional interruption. He found that after from sixteen to twenty days the blue line on the gums began to disappear, and that in proportion as the quantity of lead present in the urine augmented, the paralytic phenomena became less and

less conspicuous, the nutrition of the paralysed muscles and the general nutrition of the body underwent improvement. (*L'Imparziale*, March 15, 1878.)

The Influence of Hydrotherapeutics on Woman.—M. Sieffermann, after strongly advocating hydrotherapeutics as a powerful means of promoting the general functional activity of the uterus, proceeds to state that he considers it to be the best therapeutic agent for girls at the age of puberty. He can furnish from his own experience numerous instances where young girls who had not menstruated and who were delicate became regular after a short hydrotherapeutic treatment; and many in whom the severe distress that accompanied the establishment of the catamenia was materially relieved, the means employed being only the general douche. The same benefits may often also be observed at the menopause. M. Sieffermann does not intermit hydropathic treatment, though he admits that hydrotherapeutists are divided in opinion upon the point, during the process of menstruation, and states that during the six years he has practised it, he has never seen any ill effects. He takes the precaution, however, never to employ affusions, the wet cloth lotions, the piscine or local applications, and contents himself with the general douche. Such accidents as have been recorded he attributes to want of ordinary skill and to inexperience in the employment of the method. He asks the question whether hydrotherapy should be continued in the early stages of pregnancy, and repeats what he had remarked in a previous part of the lecture in regard to its action on the menstrual function, namely, that a method of treatment which renders the general circulation more active, excites the function of digestion and calms nervous irritability, can only produce good effects in a state which usually has precisely opposite effects, and he thinks its use has been instrumental in preventing miscarriages. It should be practised in all cases of painful pregnancy. The hydrotherapeutic treatment of abortion varies according to whether it is only threatened or has advanced so far that it cannot be prevented. In the latter case, the ovum must be expelled from the system as rapidly as possible, and in such mode that the consecutive hæmorrhage should be as slight as possible. With this end in view, a *bain de siège* is given at a temperature of 12° C., and the proceedings are in accordance with general rules; but if abortion be only threatened, the best practice consists in making general friction in the cold sheet, friction followed by a *bain de siège* more or less prolonged at 16° or 18°. At the end of a few minutes the bath is cooled by pouring water at 10° C. over the shoulders of the patient. During the whole time an assistant applies sharp friction to the whole body with both hands. M. Sieffermann

gives minute details in regard to the method of proceeding in the application of friction. Hydrotherapy again, he says, can be advantageously employed in the different phases of normal accouchement, and especially immediately after the delivery of the child, to expedite the expulsion of the placenta, and to assist the uterus in maintaining contraction. The water of the bath he uses is from 10° to 12° C. in temperature, employed by means of an arrosoir, the jets of which are directed to the abdomen and loins. The sensations are described as being soothing till the uterus contracts, which it does in the course of five minutes, with great force, persistency, and some pain. In women generally, he remarks, as hydrotherapeutists well know, a cold *bain de siège* should not be taken without the application of a cold compress to the head, as the reflex action of the cold applied to the pudenda is sufficient not only to drive the blood from the abdominal veins, but also to contract the femoral veins and thus to induce a tendency to congestion of the upper parts of the body. The bath, lastly, may be used in cases of slow and painful delivery at a temperature of 26° to 28° C. for twenty or thirty minutes, when it acts as an antispasmodic and slightly excitant. (*Gazette Medicale de Strasbourg*, May 1, 1878.)

Sprudel Salts in the Treatment of Gall-Stones.—Dr. Goldsmith, of Rutland, Vermont, determined to try Carlsbad for a member of his family who suffered much from gall-stones. Opium could not be borne in any form. Morphia produced uncontrollable vomiting. He placed his patient under the care of Dr. Seegen of Vienna, who spends the season at Carlsbad. The course followed was, substantially, that the patient was directed to rise early, for the waters should be taken before breakfast. A medium-sized tumblerful of the hottest water (Sprudel spring) was to be slowly sipped; in about fifteen minutes another, and in fifteen minutes more a third. A walk was now taken, and in half an hour breakfast. The temperature of the water is thought of consequence, as if too hot it produces a sense of fulness in the head, or even headache, whilst if taken too cold it purges. For breakfast, the patient was allowed a cup of coffee or chocolate, two boiled eggs, and bread; for dinner, soup, rare meat, and vegetables, no cheese, butter, or vinegar; exercise was enjoined. Under this treatment his patient had no more attacks of colic. It is not thought that the waters play any solvent part with regard to the gall-stones, but it is believed that they produce a great flow of limpid bile, which helps mechanically to expel them, and at the same time to cure the catarrh of the gall-bladder and to lesson spasm. The course is six weeks, and the diet and regimen help to break up the habit of making gall-stones. Those who after the course are weak,

are advised to go to the iron spas. Dr. Goldsmith states that his neighbours as well as himself have used the Sprudel salts, imported and in solution, with equally good results. They have tried them in cases of gall-stones in gastric catarrh, especially of the intemperate and in enlargement of the liver, with most effect in acute cases presumably simple or subacutely inflammatory, and chiefly in that form accompanying hard drinking, which is almost always enlargement with fatty infiltration. (*Boston Med. and Surg. Journ.*, Jan. 31, 1878.)

The Effects of the Solfatara on Phthisical Patients.—

Dr. Pettiruti has furnished an interesting report to the professors composing the Sanitary Commission of the "Ospedale degl' Incurabili," on the effects of residence at the Solfatara di Pozzuoli, in close proximity to the ancient semi-extinct crater, with use of the acidulated ferruginous water of the district, on patients suffering from phthisis. The results of his observations on three patients are summed up in the following observations:—

1. That the broncho-pneumonic process already commenced in the three patients was cured in none, but on the contrary, in the first the change of air had made him materially worse, and had rendered it requisite that he should be removed back again to the hospital from whence he had been sent; whilst in the two others the progress of the disease had been slower and of less extent, but still distinctly marked.

2. In the second and third patients Dr. Pettiruti satisfied himself that, notwithstanding the extension of the disease, there was a distinct diminution in the cough and in the quantity of the expectoration.

3. That the febrile temperature was lowered to a slight degree in the first patient, and to the normal in the other two.

4. That great improvement was observable in the digestive functions in all three of the patients, the appetite being increased, and digestion of the food, which was supplied in sufficient quantity, being regularly performed. This improvement was continuous and progressive, though as the disease was advancing the patient ought to have become worse.

5. That the general condition of nutrition was very distinctly improved in the second and third patients, as shown by the increase of colour in the cheeks and of the weight of the body.

Finally, Dr. Pettiruti remarks that in the explanation of such improvement as did occur in the second and third cases, regard must be taken to other factors than the air of Solfatara. It was spring time when the experiment was tried; the diet was very carefully selected, and great attention was paid in every way to the invalids. (*Annali Clinici dello Ospedale Incurabili*, Anno 1, Fas. v.)

The Action of Sulphuretted Waters in reproducing the Symptoms of Syphilis when Latent.—The explanation of the effects of sulphuretted waters in reproducing the symptoms of syphilis is stated by Güntz to be produced by the following: 1. A decomposition of albumen is produced by the water. 2. This decomposition is expressed clinically by a transitory chlorotic condition, owing to diminished size of the liver and spleen, and by increased excretion of urea. 3. This increase of urea is due to the action of the sulphuretted water in withdrawing oxygen, the effect of which is increased by coincident diminution of the activity of the heart and respiration. 4. The formation of new syphilitic products is effected at the cost of metamorphoses of albuminous substances which by their decomposition produce new conditions under which the syphilitic poison can act, and new combinations. 5. As long as the capacity of syphilis contagion to attach itself to organic elements exists, so long can the poison remain in the body. Mercury acts in the same way as sulphuretted waters, since it forms an albuminate in the body. (*Pamphlet*, 1877.)

Electricity in Nervous Vomiting.—Signor P. M. Semmola reports twenty cases in which this method of treatment was practised. His researches have extended over several years, and he has invariably used the constant current, and recovery has taken place with equal certainty and rapidity. Even after the first application the patients were able to tolerate food, which for many weeks previously they had been in the habit of rejecting. He does not limit the value of the current to the treatment of nervous cases alone, but thinks that in it we possess a valuable means of diagnosis, since it does not succeed in those forms of chronic vomiting which proceed from other causes, as, for example, from the presence of worms or from uterine disease. (*L'Imparziale*, March 15, 1878.)

The Treatment of the Acute Inflammations of the Middle Ear.—Dr. Weber-Liel has written a paper on this subject specially intended for non-specialists. After describing the usual symptoms, earache and purulent discharges, &c., occasioned by the membrana tympani being perforated, in consequence of a violent otitis media caused by muco-purulent matter, which has accidentally been blown from the Eustachian tube into the hyperæmic tympanum. What is a physician residing in the country, unable to secure the services of a specialist, to do to prevent the otitis from running such a course as to jeopardise the functions of the ear, or even the life of the patient? In the first place he should employ the water douche, and then the air-bath, for which purpose two instruments are required which

every practitioner ought to possess, viz., the naso-pharyngeal syringe and the air-bag. The latter being for the removal of the secretion from the tympanic cavity, and the syringe for cleansing the naso-pharyngeal space. If the syringe is used previous to the air-bath, the latter will be more successful, as it will not then carry any mucus from the orifice of the Eustachian tube into the tympanic cavity. The bulbous nozzle of the syringe, charged with a warm solution of common salt or ammonia, is passed into one nostril of the patient, and the syringe emptied by a moderate pressure upon the piston. The lotion is injected into the nasal cavity, whence it passes into the pharyngeal space toward and into the tubal orifices, and after washing away any mucus which may have gathered in these parts, the liquid returns through the other nostril. It is necessary, however, to be very cautious in using these injections, for if too much force be used, or the other nasal cavity be obstructed, the fluid might be forced into the healthy middle ear, causing inflammation. The cleansing of the naso-pharyngeal cavity is followed by the air-bath. The bulbous nose-piece of the air-bag is firmly inserted into one nostril, the patient takes a little water into his mouth, and swallows it at a given sign (1, 2, 3), while at the same instant the surgeon suddenly compresses the bag. In this manner the air in the naso-pharyngeal cavity is condensed, and will, during the act of deglutition, escape into the middle ears, provided the Eustachian tubes are not completely obstructed. This experiment must be repeated several times in succession, after which the patient usually feels greatly relieved. A second local remedy in the treatment of catarrhal inflammations of the middle ear is the application of cold on the ear. Leeches have been repeatedly recommended to be put in front of and behind the ear; but they only afford temporary relief, and in many cases do positive harm. The favourable influence of cold is usually very marked. A small towel is folded, soaked in cold water, and put on in such a manner that it covers the posterior portion of the face, the ear, and side of the neck. The wet towel is covered with a dry woollen cloth. After half an hour the wet cloth is changed. The change of dressing must be done so quickly as to leave the ear uncovered but a second, as otherwise the patient might catch cold. After a few applications the pain abates. They need now to be changed for one, two, or three days, till the pain does not return. For simple uncomplicated cases this local treatment is all that is needed besides the regulation of the bowels, which always must be attended to. For internal medication oil of turpentine is highly recommended, to be given in capsules, each containing from ten to twelve drops; three capsules are taken at noon, and five or six in the evening. The turpentine is continued for two

or three days only. (*Chicago Med. Journ. and Exam.*, No. 5, Vol. xxxv.)

Preparations of Lithia and their Therapeutic Uses.—According to M. Limousin, carbonate of lithia is most frequently administered in the form of a solution.

Carbonate of lithia (crystallized) 50 centigr.
Aërated water 500 gr.

The water thus prepared is taken either pure or with wine, two to four glasses a day, according to the directions of the physician. For those patients who dislike the strong alkaline flavour of the lithia, the dose can be given as a citrate or carbonate with the flavour concealed, the dose being 10, 15, 20, or more centigrammes. One or two glasses of seltzer water should be drunk afterwards to render dissolution of the salt more easy. The preparations of lithia for external use are not very serviceable, some new formulas are therefore recommended.

1. Oleostearate of lithia 4 gr.
Axunge 30
2. Glycerine 30
Carbonate or citrate of lithia 4 m.
To be shaken before using.
3. Glycerole of starch 30 gr.
Carbonate of lithia 4 m.

These preparations may be employed as ointments for enlarged joints and in swellings caused by the accumulation of urate of soda in gouty and rheumatic persons. (*Journal de Médecine*, Mai, 1877.)

Ergot in Pneumonia.—Dr. J. B. Yeaman, of Crystal City, Jefferson County, has tried ergot in the first stage of pneumonia with success. His treatment was as follows: he was called to see a man aged thirty, in whom the general signs of the disease were well marked. The temperature, $104\frac{1}{2}^{\circ}$ F., pulse 108. Ergot was given every two hours fl. ext. ʒss. The temperature increased at first, but on the following morning both temperature and pulse were 104° . Dyspnœa was less troublesome, sputum contained less blood, and the cough was much less painful and frequent. After two hours profuse perspiration the skin became moist. There was now no pain, and the patient was ordered:

R Ammon. muriat. ʒij.
Syr. scillæ.
Glycerini, aa ʒi.

M.S. Dessert-spoonful every two hours.

The dose was continued for two days, and on the fourth day the man was found up at breakfast. He was ordered to bed, and convalescence was uninterrupted and complete, and three days after the patient was discharged.

Dr. Yeaman hopes the treatment will receive attention at the hands of the profession, and begs that it may be allowed a trial. (*St. Louis Clinical Record*, Feb. 1878.)

The Treatment of Chorea.—Rosenbach calls attention to the benefit that may be derived in this disease from the employment of a constant current of electricity as a means of determining the position of painful points, which in many instances, as for example on the vertebræ, cannot be determined by the mere pressure of the finger alone. In two cases of chorea, one in a girl of nine, and another in a girl of twelve years of age, he was thus enabled to discover certain painful points. To these he at once applied blisters, and subsequently a constant current of electricity, with perfect success in both cases. (*Archiv f. Psychiatrie*, B. vi. p. 830.)

Notes and Queries.

BELLTHAL MINERAL WATER.—This is one of the most agreeable mineral waters with which we are acquainted. The samples which we have tried contain a very large proportion of carbonic acid, affording a most pleasing and refreshing beverage when taken alone, and mixing well with wines and spirits, without destroying their flavour.

QUINQUININE.—A preparation bearing this name has been sent us by Messrs. Mackey, Sellers, & Co., who say that it contains all the alkaloids of the officinal cinchona bark, and is in many respects superior to sulphate of quinine. As the other alkaloids of cinchona bark have all to a greater or less degree the same action as quinine, it appears to be a source of needless expense to separate them from quinine when the latter is to be used for many purposes in which a slight difference in the dose given can be of no consequence to the patient. The observations of Dr. Vinkhuysen on Quinetum in the *Practitioner* for February of this year also seem to show that the mixed alkaloids may sometimes be better than quinine alone. The present preparation very closely resembles sulphate of quinine in its appearance, and seems likely to prove a serviceable remedy.

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* * Any of the foreign works may be procured on application to Messrs. DULAU, of Soho Square, W.C.; WILLIAMS and NORGATE, of Henrietta Street, Covent Garden, W.C.; or BALLIÈRE, of King William Street, Charing Cross.

Department of Public Health.

DISINFECTION BY HOT AIR.

BY W. H. RANSOM, M.D., NOTTINGHAM.

HAVING read with interest the paper by Dr. Vallin on disinfection by hot air, translated in your March and April numbers, I am tempted to offer the following remarks on the same subject.

To save time and space, I will assume, that when the particulate contagia of small-pox and scarlet fever are heated to a temperature of 230° F. to 250° F., they cease to be able to spread those maladies.

By this limitation it is not intended to deny the probability that heat, like some chemical disinfectants, destroys the activity of the contagia of some other allied diseases. But it is intended to emphasize the teaching that the contagia of the infectious diseases should be separately studied in their relations to disinfectants. Because already enough is known to enable it to be said that they differ from each other in this respect; and further, as these relations vary with the properties of the carriers of the contagia, it is not less necessary to study for the purpose of practice the variations thus produced.

The whole group of septic disease is excluded, partly because the almost universal distribution of their germs in inhabited areas diminishes for them the value of any, even the most efficacious disinfecting measures, partly because heat-resisting spores have been met with chiefly, if not exclusively, among those organisms which are associated with putrefaction or fermentation, and thus for them the value is diminished of this particular method of disinfection. Happily for mankind the

antiseptic method of Lister has greatly diminished, if not entirely removed, the regrets entertained that so convenient a procedure as disinfection by hot air should deserve for these diseases so little confidence. These views would not, however, lead me to defend a neglect of cleanliness, or of free ventilation, or of disinfection by heat and chemical agents, as proper subsidiary measures in surgical and maternity hospitals.

So that disinfection by hot air is here only spoken of as important in connection with small-pox and scarlet fever, and perhaps a few other closely allied diseases.

In harmony with the assumption with which I started, the temperature to be used in disinfecting by hot air should be between 230° F. and 250° F. But it may be better to say that for each textile fabric carrying contagia it should be as high as the fabric will bear without injury, and be continued as long as may be requisite to raise its central parts to the temperature of the chamber.

This rule would, I think, receive Dr. Vallin's assent, and be generally accepted. If so, it lessens very much the significance of the discrepancies contained in the published results of observations upon the temperature at which different fabrics commence to change colour; or at any rate it reduces them to the level of practical detail. Dr. de Chaumont used a dry air chamber, and placed his samples upon a metal or porcelain plate; and his observations showed a commencing change of colour at a lower temperature than mine did. Dr. Vallin also used a dry air chamber, but appears to have been alive to the influence of the contact of a good conductor. His results gave a temperature intermediate between that obtained by Dr. de Chaumont and that I obtained. My observations were made in a chamber containing hot air charged with all the products of combustion of gas, and therefore far from dry; and the samples were suspended so as to be heated only by the current of air. Bearing in mind then the differences in the mode of observing, it is not improbable that they may, at least in part, account for the different results alluded to by Dr. Vallin.

After some years of practical experience of one kind of chamber, it may be of interest to give the results as far as they bear on this question.

Dr. Edward Seaton, Medical Officer of Health for Nottingham, has kindly informed me that in the hot air chamber under his direction, which is constructed upon the principle suggested by me, 7512 infected articles of various materials—many of them valuable—have been disinfected during two years of work. The average temperature of the entering, which is the heating current, has been 247° Fahr., but it has often risen to 255° Fahr., and of late this temperature has been intentionally maintained. The outgoing current of this chamber is 10° Fahr. below the inlet, and the temperature of the centre is usually midway between that of the inlet and the outlet. The above mentioned 7,512 articles were therefore submitted, for periods of time varying from two to twelve hours, to an actual temperature of more than 240° Fahr., and of late to 250° Fahr. Yet none of them were injured.

In a hospital or other institution in which the same things are baked many times over, the results of heating are accumulated. In the General Hospital, Nottingham, white blankets after about thirty bakings in three years were discoloured, but not injured so much as they would have been had they been washed as many times as the baking had saved them from. The beds, mattresses, and pillows were discoloured on the surface and weakened in strength; but as they had required to be unmade, washed, and remade, many times less, a saving in wear and tear had resulted. So that the upholsterer who had worked on the premises for thirty years assured me that he had used less material and done less work upon the same number of beds since the hot chamber had begun to work.

Manifestly, if a process of disinfection be efficient and causes only fair wear and tear, or not more than other absolutely needful cleansing operations, it is not open to objection on the score of injury done to the materials.

For these reasons, and bearing in mind the additional security obtained by using the highest temperature which can be safely employed, I am not yet disposed to advise a lower temperature in my chamber than 250° Fahr. for the entering current; and the fear entertained by Dr. Vallin that the iron walls of the chamber may cause singeing need not give rise to serious

alarm, because these walls are never hotter than the current which warms them.

As, however, each kind of chamber may singe at different temperatures, and after different periods of exposure, and as even in the same chamber it is necessary to vary the length of exposure according to the properties, the bulk, and the humidity of the articles, as well as according to the capacity of the chamber in relation to its contents and to the velocity of the current of hot air through it, there is room for some differences of procedure among the officials who conduct these operations.

A very important question is raised by Dr. Vallin's recommendation to introduce a certain amount of watery vapour short of saturation into the hot air, and it justifies a careful consideration. He holds that the moisture in the air would enable the particulate contagia to be made harmless at a lower temperature; that the greater conducting power of the moist air would facilitate the penetration of the heat into beds, &c.; and that the textile fabrics would suffer less change of colour.

The value of this suggestion must be admitted if observation and experiment should justify the reasoning by which it is supported. Some difficulties, however, appear to me to hinder its acceptance at present. The evidence known to me, which tends to show that humidity lowers the temperature at which spores, and perhaps germs, are killed, bears chiefly, if not exclusively, upon those spores or germs which are related to septic or fermentative processes in or out of the body. On other grounds it has already been shown that disinfection by heat cannot be trusted to for septic diseases. But even in the case of those kinds of spores which resist higher temperatures when dry than when moist, I believe the observations with moist heat have been conducted in steam under pressure or in water; and that no evidence has been adduced to show that humidity in the air short of saturation has lowered the temperature at which such germs have been killed. Again, for some members of this group of spores even prolonged boiling may fail to kill, and thus it would seem that, whether moist or dry, within the limits required by the fabrics which carry the spores, heat in any form

cannot confidently be trusted to kill septic germs, except when experiment has proved this for a particular species.

Moreover the evidence, such as it is, in favour of the view that the spores of some protorganisms essentially connected with putrefactive and fermentative processes, and with diseases of the septic group are killed by heat at a lower temperature wet than dry, has not, so far as I know, been extended to the particulate contagia of small-pox and scarlet fever, or of those allied diseases for which disinfection by hot air may be prudently advocated.

Although the greater conductivity for heat of moist air than dry would, as Dr. Vallin says, be a certain advantage, I cannot, unless experimental evidence be given, accept his opinion that the penetration of heat into a bed would be thereby facilitated. For I found that, until the normal hygrometric moisture was driven out sufficiently to cause a loss of weight equal to nearly one-tenth, the thermometer in the centre of a bed would not rise to the temperature of the chamber. In short, I imagine that the conduction of heat by the air has but little influence in determining penetration.

That moisture in the hot air will diminish the risk of singeing is, I think, very probable; and the advantage of this would be considerable in practice; but should, as I fear, the presence of watery vapour require a more prolonged exposure in order to obtain penetration, or should the quantity of moisture be so great as to need subsequent drying of the clothes, &c., there would, I think, ensue a balance on the wrong side.

It is to be desired that some one who has the time and opportunity would put Dr. Vallin's views to the test of careful experiment.

The value of a current of air through a hot chamber, it would seem to me, cannot well be overstated; but the two forms of chamber introduced by Dr. Esse, of Berlin, and constructed upon the principle used and recommended by the late Dr. Henry, are, I believe, wanting in this needful aid to penetration. Unless therefore some evidence be given that in a chamber so constructed the heat penetrates through a bed, grave doubts must hang over its trustworthiness. If, on the trial being made, it be shown that not only hot moist air, but such air when still

or only feebly moving, will heat a bed through, a decided advantage would, I think, be gained; and in this country, where steam is so much used, excellent, cheap, and numerous disinfecting chambers might, and indeed ought, to exist in every town.

The following corrections are required in Dr. Vallin's paper:

The temp. 239° F. mentioned by Dr. Vallin in speaking of one of my observations should be 293° F. The temperatures given in Dr. Vallin's abstract of my table should not have been to the tenth of a degree Fahr. There is some mistake in this. No attempt was made by me to achieve such accuracy. Dr. Vallin has, I fear, in consequence of some obscurity in my expressions, estimated the cost of working one of my chambers too favourably. A hospital hot chamber should have a capacity of about 100 cubic feet, and would consume about 40 cubic feet of gas per hour. The chamber referred to in my former paper had a capacity of 25 cubic feet only, and consumed about 10 cubic feet an hour; but that was an experimental one only, and not sufficient for permanent use.

REPORT OF THE MEDICAL OFFICER OF THE LOCAL
GOVERNMENT BOARD. (1) MR. NETTEN RADCLIFFE
ON HOSPITAL HYGIENE AND THE FURTHER
PROGRESS OF LEVANTINE PLAGUE; (2) DR.
BALLARD ON EFFLUVIUM NUISANCES.

THE statutory appointment of Medical Officer of the Local Government Board lapsed with the resignation of Mr. John Simon. The statute under which he held office made no provision, it would appear, for the continuance of that office. But the Local Government Board has ample powers for creating both office and officers, and under these powers it has appointed a Medical Officer, practically continuing uninterruptedly the appointment held by Mr. Simon. Dr. Seaton, long Mr.

Simon's colleague, and the Senior Inspector of the Medical Department when Mr. Simon was Medical Officer, succeeds that gentleman, in fact, as Medical Officer of the Board. Dr. Seaton, however, has not the administration of the grant for scientific (pathological and etiological) purposes formerly carried out by Mr. Simon. This grant has now been transferred to the Royal Society, which will be intrusted with its administration, and Dr. Seaton's duties as Medical Officer will be limited to the administrative work proper, so far as that concerns the Medical Department, of the Local Government Board. A further alteration occurs in the mode of reporting of the Medical Officer. Mr. Simon's reports were made under the statute by which he was appointed, and thus in a fashion formed an independent series. The present report, the first issued by Dr. Seaton, appears as a Supplement to the Sixth Annual Report of the Local Government Board, and subsequent reports of the Medical Officer will be published in a like manner.

We are by no means assured that the transference of the scientific grant for pathological and etiological purposes from the Medical Department of the Local Government Board to the Royal Society will be a gain to the profession. It is true that the grant had been originally made at the instigation of Mr. Simon, and that it was under his guidance the important results were produced which have come from it. But there is no sufficient reason to suppose that his successor and former colleague would not have been able to carry out and to develop further the lines of scientific work which he laid down, while the interruption of that work and of the manner of reporting it is an irreparable loss to scientific hygiene in this country. It is not to be anticipated that the administration of the grant by the Royal Society will have that singleness of purpose which characterised Mr. Simon's administration, and it is to be feared that the researches to which the grant may now be applied will become detached and irregular,—each research no doubt valuable in itself, but the different researches wanting as a whole that coherency and continuity of object which so distinguished those followed under the firm grasp of the former Medical Officer.

Dr. Seaton, in this his first report as Medical Officer of the

Local Government Board, contents himself, after a graceful allusion to his predecessor, with a brief and formal summary of the principal work of the Medical Department during the year 1876, and with presenting in an Appendix the reports of Mr. Netten Radcliffe and Dr. Ballard referred to in the heading to this article. To those who have been accustomed to look forward to the Medical Officer's personal report as a principal event of the hygienic history of the year, Dr. Seaton's report will be a disappointment. It was not anticipated that Dr. Seaton would attempt to imitate Mr. Simon's reports; neither was it necessary he should do so; but Dr. Seaton has a well-defined individuality, and this was expected to be manifested in his first report. Some part of this individuality has, we gather from the report, been absorbed (somewhat unfairly we should say, having regard to the speciality of the Medical Officer's report) in the Board's Annual Report; moreover, ill-health, from which Dr. Seaton, it is known, has unfortunately suffered since his appointment, may have influenced the writing of the report. But be this as it may, Dr. Seaton has decided to rest the credit of his first report on the contents of the Appendix, and it cannot be said that he has not justification in so doing. Indeed, probably no report has issued from the Medical Department now of the Local Government Board, formerly of the Privy Council Office, which more completely sustains the reputation of that Department.

In addition to the reports to which reference has been made, the Appendix contains tabulated statistics relating to public vaccination in 1874 and 1876; a return of the medical inspections made by the Medical Department in 1876, and copies of several official memoranda prepared by the department and issued by the Local Government Board during the year. The great interest of the report rests, however, in the several supplemental reports given in the Appendix.

First in order among these reports are three reports on *Hospital Hygiene* by Mr. Netten Radcliffe. These reports include (1) a Report on Erysipelas in the Radcliffe Infirmary, Oxford (1874-5); (2) a Minute of Conferences with the Medical and Surgical Staff of the Norfolk and Norwich Hospital and others, on the Sanitary Condition and Administration of the

Hospital (1875); and a Report on the Sanitary Condition of the Royal Infirmary, Manchester (1876). The interest of these well-known reports has been so largely discounted by the discussion to which they were severally subjected at the time when the reports were first made, that they need not occupy much of our attention here. It is useful, however, to have them brought together in a form generally accessible, and it should be noted that a postscript is added to the report on the Radcliffe Infirmary, which completes the instructive story of the prevalence of erysipelas there.

These reports principally deal with a phase of hospital administration which has been suffered of late to fall too much into the background. All the reports are based upon inquiries into the origin of outbreaks of fatal traumatic infections within the wards of the several hospitals. But the results of these inquiries disclose the important fact, that the outbreaks depended not so much upon defects of hospital construction and arrangement as upon defects of medico-sanitary administration. Not that defects of construction and arrangement were absent in the several cases, but these played probably a subsidiary part to the defects of management in the development of the traumatic infections. Of these latter defects may be noted the want of any true hygienic supervision and responsible hygienic control of the hospitals; the neglect of the hygienic relations of surgical cases, both as regards the patients themselves and as regards their relations to other patients; and the dissemination of infection from patient to patient by the agency of the medical staff and of the nurses. In fact, Mr. Radcliffe brings out in a very clear light the neglect in the several cases of the consideration of the patient as one of a community peculiarly circumstanced, and liable to peculiar dangers; the attention being almost wholly concentrated upon the patient himself as an individual. Without underrating structural arrangements, these reports make it obvious that these arrangements are subordinate to a much larger extent than is commonly understood to questions of internal management. In other words, he shows that the best constructed and arranged hospital would become unhealthy if it were managed after modes on which he has to animadvert in these reports; while, on the contrary, reported unhealthy hospi-

tals might be made tolerable if not, indeed, wholesome, under a method of management which he indicates. He especially lays down as cardinal to the proper hygienic management of any hospital the necessity of a definite registration of the various diseases, infectious and other, originating in its wards, and next the necessity for a responsible medico-sanitary supervision of the hospital. It strikes the reader of the reports with surprise to find how these seemingly obvious requirements failed in the several important hospitals which formed the subject of inquiry, and an uncomfortable suspicion is engendered that much of the same sort of neglect is to be found in other hospitals.

Although coming last in order in Dr. Seaton's report, a Memorandum by Mr. Netten Radcliffe on the progress of *Levantine Plague* in 1875-76 and part of 1877, may be noticed here. In the previous annual report of the Medical Officer—Mr. Simon's last annual report—Mr. Radcliffe gave an account of the modern history and recent progress of Levantine Plague with reference to certain late reappearances of the disease in the Levant. In the present Memorandum he relates the history of the disease as it appeared in 1875-76, and early in 1877. First recapitulating the several reappearances of plague—(1) in Western Arabia in 1853; (2) in the province of Bengazi, Tripoli, 1858-59; (3) in the extreme north-west of Persia (district of Maku, Persian Kurdistan), 1863; (4) among the Arabs occupying the Hindieh Marshes on the right bank of the Lower Euphrates, in 1867; (5) in the tract of country lying to the south of Lake Urumiah, Persian Kurdistan, 1871; (6) in the province of Bengazi again; (7) in Western Arabia, also again; (8) among the Affij Arabs, occupying the great marsh on the left bank of the Lower Euphrates, north and east of Diwarieh in 1873-74; and (9) also on the Lower Euphrates—Mr. Radcliffe then describes in some detail the outbreaks of 1875-76.

Plague reappeared on the Lower Euphrates in November 1875, and spread over the whole district lying between the Tigris on the east and the Syrian desert on the west, and the junction of the Shat-el-Hai with the Euphrates on the south and Bagdad on the north. In this outbreak Bagdad was attacked for the first time since the reappearance of plague in Mesopotamia. It has

been estimated that the disease caused 20,000 deaths within the area of its prevalence in Mesopotamia in 1875-76. The next year, 1876-77, plague reappeared in the same district, and Bagdad again suffered. The loss of life from plague in Bagdad in 1875-76 is stated at 2,611; in 1877 at 1,672.

In 1876 plague appeared also at Shuster, and in the surrounding district in Persia, and caused a stated loss of 2,500 lives.

Early in 1877 the disease broke out at Resht, Persia, near to the south-west coast of the Caspian. In his next memorandum on this subject, Mr. Radcliffe will no doubt have more to say on the progress of plague in Persia, as well as upon the appearance of plague in 1876-77.

A second part of Mr. Radcliffe's memorandum is given to an account of the measures adopted by the Ottoman and other governments for the prevention of the plague. So much of this memorandum as relates to the practice of quarantine forms an instructive illustration of the futility of that practice.

The Memorandum is illustrated by two maps, one showing the seats of plague from the reappearance of the disease in 1853 to the close of 1876; the other, the seats of plague in Mesopotamia and Persia from 1873 to 1876.

Dr. Ballard's report, which occupies 173 pages of the Appendix, gives the results of the first part of an elaborate inquiry, in which he is still engaged, as to *Effluvium nuisances arising in connection with various manufacturing and other branches of industry*. This important report, which is profusely illustrated, gives an exhaustive account of the various nuisances with which it is concerned—a sort of nuisances which hitherto have very largely proved a stumbling-block to sanitary administrators. Dr. Ballard, in an introductory chapter, deals first with the question of the degree and extent of public inconvenience arising from industrial nuisances; he then proceeds to consider the classification of offensive businesses; next he discusses the senses in which industrial nuisances may be regarded as injurious to health; afterwards he examines the means of preventing or minimising industrial nuisances mostly feasible, and lays down general principles of prevention; and, finally, he treats of the difficulties of local authorities in dealing with such nuisances. Of these

questions, those relating to the influence of trade effluvia on health, and to the abatement of nuisance from them, have the greatest interest for the reader.

Upon the question of the influence of these effluvia on health Dr. Ballard gives no new light. At the outset of the inquiry it appears to have been determined between Dr. Ballard and Mr. Simon, who still held the post of Medical Officer to the Local Government Board when the inquiry was first decided upon, that "any valid statistical investigation was quite impracticable, partly on account of the enormous labour which it would have involved, and the consequent protraction of the inquiry to a period altogether undeterminable; but mainly on account of the obstacles, at present insuperable, to eliminating the influence upon health of other circumstances (some known or knowable, others unknown and unknowable), the influence of all of which however would have, one by one, to have been eliminated had this method been adopted." Failing this line of research Dr. Ballard had to content himself with such particular information as he had received from medical men who had the opportunity of practising among communities exposed to the influence of particular trade effluvia, checking these as far as practicable from our ascertained knowledge, experimental or other, of the physiological or pathological effects exercised by septic or chemical matters diffused in the atmosphere breathed. The inquiry on this subject even thus limited involves many complicated questions, but it tends to confirm the general belief and experience that offensive trade effluvia are injurious to health. The probabilities of the case lie wholly in this direction, and as medical men become able to differentiate more clearly the influences affecting health in particular localities, there can be little doubt that the unwholesomeness of these effluvia will be made quite evident.

With respect to the abatement of trade nuisances Dr. Ballard writes very hopefully, and he observes generally that "the tendency of the inquiry is towards establishing this point, viz. that all, or nearly all, the trades now causing offence from the diffusion of effluvia may be so carried on as not to cause offence at all, or only offence of such trifling nature as may well be tolerated by persons who live in communities." How this is

to be brought about is shown in detail under the heads of the several offensive trades discussed. The trades treated of in the present report are arranged in three divisions, and a simple statement of these divisions and of the trades included in them will be sufficient to show the surpassing interest of the work for sanitary authorities and their officers.

The first division of the report is devoted to effluvium nuisances arising in connection with branches of industry involving the keeping of animals. In this division are included horse-keeping, cow-keeping, and pig-keeping. Dr. Ballard treats of each of these trades separately; he then considers the injury to health arising from the improper keeping of animals; and next the mode of preventing the nuisances.

The second division of the report deals with the effluvium nuisances arising in connection with the slaughtering of animals, and includes the slaughtering of horned cattle, sheep, and pigs, for human food, and the slaughtering of horses.

The third division deals with the effluvium nuisances arising in connection with branches of industry in which animal substances or substances of animal origin are principally dealt with. This division includes the curing of bacon, the curing of fish, the frying of fish, the trade of fellmonger, leather-dressing and parchment making, tanning, and the preparation of "pickers," hides, the manufacture of glue and size, the manufacture of prussiate of potash, the boiling of flesh, tripe, trotters, ox-feet, &c., and the preparation of neat's-foot oil, and the trade (sometimes associated) of preparing glue-pieces, the manufacture of fish-liver oil, fat-melting, dip-candle making, the manufacture of soap, the manufacture of articles of commerce from blood—to wit, the preparation of blood for use by Turkey-red dyers, the manufacture of blood-albumen, the manufacture of blood-clot into manure, blood-drying and blood-boiling, the trades of gut-scraping and gut-spinning, the preparation of sausage-skins, bone-boiling and bone-size making, the manufacture of animal charcoal and sulphate of ammonia from bones, the re-burning of animal charcoal, and the manufacture of artificial manures.

Of all the trades named in the divisions Dr. Ballard gives a careful description, showing the conditions under which they become sources of nuisance and the requirements for the prevention

of such nuisance. As a compendious description of the several trades named this report would be of great value; but viewed with reference to the object for which the report is designed, namely, to form a guide for the abatement of certain of the most offensive nuisances to which communities are liable to be exposed, the report is one of the most important official papers which has been published in recent years..

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NOTE ON A CASE OF LARYNGEAL VERTIGO.

BY J. R. GASQUET, M.B.

THE history of the following case is imperfect, for I had not the opportunity of observing it myself, and all my information is derived from the patient, who is an exceptionally accurate and intelligent man. I should not therefore venture to publish it but for the interest which attaches to vertigo since Dr. Woakes's most instructive accounts of its pathology in this and other journals. My case seems to resemble closely three recently mentioned by Charcot ; ¹ and, in all, laryngeal or pharyngeal irritation may be supposed to be transmitted to the inferior cervical ganglion, as in the other varieties of vertigo. I venture to suggest that perhaps tension of the auditory endolymph is not the immediate cause of vertigo, but either is one of its co-effects, or produces it by its reflex influence on the inferior cervical ganglion, as in Menière's disease : otherwise we ought surely to find disturbances of hearing more constantly connected with all cases of vertigo. It seems more simple to suppose that the vaso-motor affection of the vertebral artery may directly produce giddiness, without any necessary intervention of the internal ear.

A. J., an admiral on half-pay, has always led an active temperate life, and had excellent health, until three years ago,

¹ See *Revue des Sciences Médicales*, July, 1877, p. 135.

at the age of seventy, he caught a severe cold which settled in his throat, and led to violent spasms of cough with urgent dyspnœa, repeated several times a day. A little later, he became subject to attacks which he thus describes:—he would instantaneously lose consciousness and fall to the ground; after (as he has been told by his family) two or three minutes, he would revive, but felt giddy and confused for some little while. This seems to have been the invariable order of the attacks, in which no convulsions, cry, or in fact any other symptom, was ever noticed. He was supposed to be suffering from some uncertain cerebral disease, from epilepsy, or from stomach-vertigo, for all of which he was successively treated, but with no effect. After a time he observed that these attacks (which recurred at very irregular intervals—sometimes several times a day, sometimes not for weeks) were always preceded by irritation in the larynx and spasmodic cough: which, however, were most frequently not followed by loss of consciousness. He put himself under treatment for the laryngeal affection, which gradually yielded; and at the same time the attacks of loss of consciousness ceased, none having occurred for the last nine months.

It will be noticed how closely the symptoms in this case resembled those produced by sudden injury to the brachial plexus as quoted by Dr. Woakes.

ON THE ACTION OF TONICS.

BY T. LAUDER BRUNTON, M.D., F.R.S.

DURING the heat of summer many people feel limp and weak, and are disposed to sympathise, in imagination, with a collar which has just been washed, but not starched. They apply to their doctor for a tonic, take the medicine which he prescribes, and feel themselves much the better for it. There can be no doubt that the word "tonic" conveys a certain meaning both to doctor and patient, definite enough in one way, but very vague in another. Both understand that the tonic will increase the strength, and remove the weariness and languor, but how it does so probably neither has attempted to find out. On turning to Pereira we find that tonics are defined as agents which increase the tone of the system: but if we inquire further what is meant by tone, and what by the system, it will not be quite so easy to give a definite answer. Perhaps the easiest way of doing this is to take the want of tone, as we term it, for which tonics are administered, and to analyse the various symptoms which we find. First of all, then, there is a feeling of languor and disinclination to exertion, mental or bodily. The person may be roused by some excitement to make considerable exertions, but these are succeeded by a greater than usual feeling of fatigue; the appetite is generally diminished, the pulse is softer and more compressible than usual. Not unfrequently, too, there is less power than usual to resist the attack of disease. Want of tone, then, assists in diminishing functional activity of the muscular, nervous, circulatory, and digestive systems, and a tonic is something which will increase this activity. Some tonics, however, act more on one system than another; and so

we have vascular tonics, nervous tonics, and digestive tonics ; as well as general tonics which seem to influence all the systems together. The functional activity of the body, and of the various organs which compose it, depends upon the combustion which goes on in it and in them, and this combustion may be increased by increasing the nutriment, by quickening oxidation, or by removing more quickly than usual the products of waste. Just as a fire may be made to burn more brightly by heaping on coal, by using the bellows, or by raking out the ashes, so in the body we may increase functional activity to a certain extent by increasing the food which a person takes, although there are limits to this, and an excessive quantity of food may prove injurious, just as one may smother a fire by heaping on too much fuel. The first class of tonics, gastric or digestive tonics, enable the patient to take more food, and with a greater relish. The most typical examples of this class are the so-called bitter tonics, such as columba, quassia, gentian, cascarilla, and hops, either alone or in the form of bitter beer. In the mouth, these drugs produce a transient bitter taste, and increase the secretion of saliva. Thus they will tend to aid the digestion of starchy matters. In the stomach they cause a slight irritation, and the stomach, not having the same power of discriminating sensations that the mouth has, feels this, not as bitterness, but as appetite ; unless the dose of the bitter should be too great, or too concentrated, and then it is felt as nausea, and is followed by vomiting. The appetite, however, which small doses excite, induces the patient to take more food, and to take it with greater relish. The increased relish is not to be disregarded. It would not be the same thing if the patient were simply to cram down, against his inclination, the same amount of food which he takes after his appetite has been excited by a tonic. We have not yet succeeded by pharmacological experiment in ascertaining precisely the effect of different emotions upon the stomach, but there can be little doubt that the pleasant feeling resulting from gratified appetite, aids digestion, while that of disgust and satiety interferes with it. Experiment has not shown that bitters increase the secretion of gastric juice in the same way that they do that of saliva, but they have an important action in lessening the tendency to putrefaction in the stomach. It is not impos-

sible that in this way they prevent the formation during digestion of such substances as butiric acid, which is a direct nervous poison, and which, when absorbed into the circulation, would of itself tend to cause weakness and debility. It must not be forgotten that a man may be poisoned by substances formed in his own intestines, as well as by poisons taken into them by the mouth.

We all greatly dread the inhalation of sewer-gas into the lungs, but probably very few of us think that noxious gases formed in the stomach and intestines are readily absorbed by the blood, sometimes producing very serious results, and probably in many other cases leading to weakness and depression, the cause of which is never suspected. Experiment has shown that bitters, if they do not increase the secretion of gastric juice, at least tend to diminish secretion of the mucus, and thus diminish, as well as by the antiseptic action just mentioned, the fermentation which mucus is apt to set up. It has been found by Köhler that even simple bitters in large doses will raise the blood-pressure by acting on the vaso-motor centre. It is doubtful whether they do so in the small doses usually administered or not, but there are other remedies—so called vascular tonics—which combine this action to a considerable extent with one upon the stomach. Thus, infusion of digitalis does not greatly increase the secretion of saliva, and produce a feeling of appetite in the stomach. It acts, in its absorption, upon the vaso-motor centre and upon the heart, rendering cardiac pulsations slower, and more powerful by contracting the vessels, and thus making the pulse firmer and less compressible. This improvement in the circulation makes itself felt in every organ of the body. Thus the stomach is relieved of congestion, digests the food more easily, is less liable to secrete mucus, and is much less apt to be distended by flatulence. This is perhaps best marked in cases of mitral disease, where the venous congestion which accompanies such a condition often leads to an accumulation of flatus, sometimes termed by patients heart-wind. The pathology of this condition has not been precisely made out, but we must not forget that interchange of gases goes on between the blood in the capillaries of the stomach and the gas contained in its cavity in the same way, though to a much less

extent, as between the blood in the capillaries of the lung and the air contained in the pulmonary alveoli. The action of another drug, very different from digitalis, namely, charcoal, upon flatus of the stomach, is very marked, and is usually ascribed in text-books to the power which the charcoal possesses of absorbing gas. But charcoal only does this when it is dry ; it loses its power when moist, and it seems incredible that a teaspoonful of charcoal swallowed after a meal and mixed with the contents of the stomach, including perhaps a pint of beer, in addition to all the gastric juice, should, after being churned up with the food in the stomach, absorb so much gas as to have any effect whatever upon the flatulent distention. It seems much more probable that its action is simply mechanical, and that by the small insoluble particles acting upon the mucous membrane, the circulation through it is so stimulated that the blood, flowing more rapidly through the vessels, absorbs and carries away a part at least of the accumulated gases. In respect, then, of its action upon the circulation in the stomach, charcoal may have some similarity to digitalis, but here the similarity ends. Charcoal has no action upon the heart. It cannot restore the balance of the circulation like digitalis, and it has none of the general effects upon the heart and vessels produced by the friction in the wet sheet so well described by Dr. Winternitz. The improved circulation produced by vascular tonics makes itself felt in the liver and intestines as well as in the stomach. The yellow tinge, indicating biliary congestion, will disappear from the eye, and hæmorrhoidal engorgement will be lessened or removed. The brain and nervous centres, under the influence of a freer current of blood, act more readily and powerfully, thought comes with less effort, and exertion, both mental and bodily, can be continued for a much longer time, without any sense of fatigue. Two conditions also disappear, which, although apparently contradictory, afflict debilitated persons at the same time. These are drowsiness and sleeplessness. Frequently do we hear debilitated patients complain that they are so heavy for sleep that when sitting in their chairs or going about their work an irresistible drowsiness comes over them, and they fall asleep in the midst of an unfinished task, but when they lay their heads on the pillow and seek rest the

conditions are at once reversed, drowsiness disappears, they toss about from side to side in the vain attempt to fall asleep, and perhaps it is not until they get up and walk about for a little that they are able to effect their purpose. Both of these conditions, apparently so dissimilar, depend upon the atonic condition of the vessels, so that instead of resisting the pressure of blood within them, they yield before it. In consequence of this the blood gravitates, while they are in an upright position, to the vessels of the abdomen and legs, leaving the brain anæmic and thus inducing sleep. On the other hand, when the horizontal position of the patient allows the blood to flow more easily to the head, the carotids and their branches, instead of contracting and keeping back the blood, allow it to circulate rapidly through the brain, and thus the unfortunate patient, unable to think at the time when he wishes to, is plagued by a rapid and incessant flow of ideas at the very moment when he least desires them. By giving digitalis so as to excite the vaso-motor centre the vessels are made to contract moderately, they no longer yield to the pressure of the blood, and thus the blood is prevented from gravitating to the abdomen and lower limbs, and a free circulation through the brain enables it to discharge its functions satisfactorily, notwithstanding the force of gravity which in the upright position always tends to make it anæmic. Again, when the patient retires to rest, the blood, which tends in a horizontal posture to rush towards the brain, is checked in its course by the carotids and their branches, which under the influence of the vaso-motor centre, stimulated by the vascular tonic, contract and regulate the cerebral circulation so as to allow only sufficient blood to pass to the brain for the purpose of nutrition, but not enough for functional activity.

It seems highly probable that a similar action is exerted upon the vessels of the spinal cord, and that thus the patient feels increased vascular power and is equal to more prolonged exertion.¹ But this is not all, for the subcutaneous cellular

¹ For a fuller explanation of the *modus operandi* of contraction of vessels in the cord in increasing muscular strength, we may refer to a paper on the curative effects of mild and continued counter-irritation of the back in cases of general nervous debility and in certain cases of spinal irritation, by Arthur Gangee, M.D., F.R.S., in the *Practitioner*, vol. xviii. p. 113.

tissue, and probably also the muscles themselves, are also benefited by the improved circulation. In the case of the subcutaneous tissue, the improvement is visible and palpable, as it is also in the muscles, though perhaps rather less plainly. In persons suffering from debility, even although there be no cardiac disorder, we find the feet swollen at night, so that the patients complain of their boots being too tight, and the ankles may be seen to pit upon pressure. Under the action of vascular tonics this condition will disappear, the ankles no longer swell, and deep and continuous pressure produces little or no mark upon the skin. The muscles, too, which were previously soft and flabby, seem to undergo a similar change, and become firmer, harder, and more elastic. The mode in which this is effected seems to be twofold—less fluid is poured out from the vessels into the tissues, and more is absorbed from the tissues into them. Thus, instead of plasma stagnating in the intercellular places of the muscles and connective tissue, a brisk circulation is kept up, by which fresh oxygen is supplied, and the products of waste are removed. The tissues are thus put into the most favourable condition for performing their functions, for, as we have already stated, functional activity depends upon the rapidity of combustion which goes on within the tissue organ. It is quite possible to paralyse a muscle by stopping the supply of blood to it, and thus preventing it from obtaining oxygen, but it is still easier to paralyse the muscle by allowing the products of its own waste to accumulate within it. The easiest way to stop combustion in the muscle is, so to speak, to smother it in its own ash. It has been shown by Krönecker that if we remove the products of waste from a muscle which has been kept in a state of tetanus until it refuses to contract any longer, we can restore its contractile power even although we supply no fresh oxygen to it. In all probability it is the accumulation of the products of waste in the muscles in debilitated persons, which is, to some extent at least, the cause of the languor which they feel. That such is the fact, is, I think, shown by the feeling of comfort which they experience when the legs are gently shampooed, the pressure being always exerted upwards so as to favour the return of the fluids from the tissues. Such a procedure tends to give a lightness and corki-

ness to the limbs, which can hardly be attributed to any change in the nervous system generally, but must rather be ascribed to the removal from the muscles of those waste products which were partially paralysing them. In talking of the nervous system, of the brain, and of the spinal cord, we have not taken into account this action of vascular tonics increasing combustion and removing waste from the nervous tissue, but probably, although we cannot see it so readily as in the connective tissue and muscles, the same process goes on in the nervous centres, and has much to do with the beneficial action of tonic remedies. I have stated that the action of tonics upon the inter-cellular fluid in the tissues is probably twofold—that they prevented excessive exudation from the vessels at the same time that they produced increased absorption. The reasons for believing that they lessen the exudation of fluid from the vessels are derived from a consideration of the pathology of œdema as made out by Renvier. The first experiments upon the subject of œdema were made by Lower, who, in 1680, tied the vena cava, and found that œdema appeared in the lower extremities. A similar condition was noticed by Bouillaud in patients suffering from thrombosis of the iliac veins, and thus it appeared clear that the occurrence of œdema was due to the absorption of the intercellular fluid being prevented by venous congestion. Lower's experiments, however, were repeated by Valsalva, Hewson, and others, without producing œdema, and the cause of its production therefore remained obscure. It was reserved for Renvier to clear up this question, and to show that the occurrence of œdema usually depended upon (increased?) exudation from the vessels as well as diminished absorption by the veins. He tied the vena cava in the abdomen of a dog, and found, like Valsalva, that œdema did not come on. The quantity of fluid exuding from the arteries was so small that the lymphatics were able to absorb it without any assistance from the veins, and thus it did not accumulate in the tissues, but on cutting the sciatic nerve on one side, intense œdema occurred in the corresponding leg. Venous congestion was equally present in both legs, as the vena cava itself had been tied, but in one the nervous influence proceeding to the arteries through the sciatic nerve kept them contracted and prevented

the exudation of more fluid than the lymphatics could absorb. In the other leg, however, where the nerve had been paralysed by a division, the vessels dilated, the limb became rosy and warm, and so much fluid was poured out that the lymphatics alone could not absorb it without the aid of the veins. Renvier next proved that this dilatation of the arteries was due to paralysis of the vaso-motor and not of the motor fibres contained in the sciatic, by cutting, in different experiments, the motor and the vaso-motor nerves in the lumbar region before they had united to form the nervous trunk. When the motor strands were divided, as they issued from the lumbar vertebræ before they had been joined by the sympathetic fibres, complete paralysis of the leg was produced but no œdema occurred; but if, on the other hand, he divided the sympathetic fibres, passing to the sacral plexus, there was no motor paralysis—the animal could still use its limb, but the vessels dilated and œdema occurred.

These experiments show pretty conclusively that dilatation of the vessels by paralysis of the vaso-motor nerves is one factor in the production of œdema. In them, of course, we see in an exaggerated condition the same phenomena which are observed in cases of debility, because in these experiments the vaso-motor nerves were completely paralysed, whereas in our patients they are simply weakened. We may sometimes see very clearly in persons whose vascular system is deficient in tone, the effect of dilated vessels in causing œdema even when there is no great obstruction to the return of blood. Such persons, when walking about in a warm day, with their arms hanging by their sides, sometimes find their hands become so swollen that they can hardly close their fists. The combined effect of heat and exercise upon their already debilitated vascular system, aided by the effect of gravitation, has caused so much fluid to escape into the tissues of their hands, that the veins and lymphatics are together unable to absorb it, and thus the fingers become swollen. The absorption of fluid from the tissues is, like its exudation into them, greatly controlled by the central nervous system. This is shown by some experiments of Gortz and Nasse. The former found that when a fluid was injected under the skin of the back of a frog, it was rapidly absorbed so long as the brain and spinal cord were uninjured, but when they were destroyed, little or no

absorption took place. As the ordinary action of the nerve-centres caused absorption to go on, we would naturally expect that any increase in their activity would quicken the absorptive process, and this indeed was actually shown by Nasse to occur. It is well known that irritation of a sensory nerve stimulates the vaso-motor centre reflexly, and causes the vessels to contract. But, in addition to this action, Nasse found that irritation of a sensory nerve also caused increased absorption. It has, not yet, so far as I know, been proved experimentally that such drugs as digitalis, which undoubtedly stimulates the vaso-motor centre, has a similar action to stimulation of that centre by irritation of a sensory nerve. Some time ago I made a few experiments upon this subject, but from imperfect graduation of the dose, the results I obtained were unsatisfactory, as the heart was too much affected by the drug, and the circulation became entirely arrested. There seems, however, no reason to believe that direct stimulation of the vaso-motor centre by digitalis will have a different action from its reflex stimulation through a sensory nerve, and we may therefore, I think, confidently assume that vascular tonics like digitalis increase the absorption of fluid from the tissues. They will thus remove the products of waste, and by keeping up a constant circulation of fresh intercellular fluid will assist combustion and functional activity in the tissues.

Another most valuable tonic, strychnia, has an action even more widely extended over the body than digitalis. It is at once a gastric, vascular, and nervous tonic, it aids digestion like other simple bitters in the way already described. It has, with the exception of quinine, a more powerful action than most other bitters in preventing putrefaction. It excites the sensibility of the vaso-motor centre, thus exerting a beneficial effect upon the circulation, and likewise directly stimulates the nervous tissue of the spinal cord itself. So great is its effect upon the vaso-motor centre that by its means physiologists have discovered that instead of being confined to the medulla oblongata as was formerly imagined, this centre extends down the spinal cord. It has just been said that an impression made upon the sensory nerves, reflexly stimulates the vaso-motor centre, contracting the vessels and raising the blood-pressure, but when a cut is made across the spinal cord just below the medulla oblongata this

result is not produced. From this experiment it has been concluded that the vaso-motor centre was entirely confined to the medulla oblongata above the place of section ; but if a little strychnia be now injected into the veins of an animal in which the cord has been thus divided, and a sensory nerve be then irritated, the vessels will contract and the pressure of the blood will rise. It thus becomes evident that the vaso-motor centre extends down the cord from the medulla, but that its spinal portion is so feebly developed that under ordinary circumstances it has no power to contract the vessels when reflexly excited by stimulation of the sensory nerve. But strychnia has the power to increase its excitability so much, that reflex stimulation in this way will produce through it a decided effect. Now when we consider that sensory impulses are proceeding every moment from the skin to the vaso-motor centre we can readily perceive how a slight increase in susceptibility produced by strychnia will have a wonderful effect in raising the tone of the vessels, and aiding the circulation. The mode in which quinine acts is not so clear, but we know from observation, that, also in small doses, it renders the pulse stronger and less compressible.

We have now seen how tonics may increase the quantity of nutriment taken into the body generally, how by their action on the vessels they quicken the circulation of inter-cellular fluid in the tissues, and by thus aiding its oxidation, and removing the products of waste, they greatly increase the functional activity of the various organs of the body.

We have now to consider how they effect the removal of waste from the body generally. The inter-cellular fluid in which these products are contained is absorbed into the general circulation by the veins and lymphatics. Unless some provision were made for its removal, it would soon accumulate in the blood and arrest the functional activity of the various tissues, beginning with that most susceptible of all, the nervous tissue, causing death. But these substances in all probability undergo further oxidation in the blood after their absorption and before they are finally excreted. This oxidation will be assisted if the respiratory movements by which oxygen is taken into the lungs are rendered deeper and more frequent, and also if the blood itself should require greater power to absorb this oxygen. Now strychnia has

an action upon the respiratory centre in the medulla oblongata similar to that which it exerts upon the vaso-motor centre, and under its action respiratory movements become both quicker and deeper. No such effect is produced on the medulla by such a tonic as iron, but under the influence of this remedy the blood corpuscles not only become greatly increased in number, as was shown by Dr. Gowers in a recent paper in the *Practitioner*, vol. 20, page 1, but they also contain a great amount of hæmoglobine. Oxygen is thus more rapidly carried from the lungs to the tissues and the process of combustion can thus go on more readily, both in the tissues themselves and in the minute blood vessels into which the products of waste have been absorbed. The rise in blood-pressure which occurs under the influence of the tonic not only affords, as we have just seen, the most favourable conditions for oxidation in the tissues and for the removal of the products of waste from them, but it also assists in their elimination from the body itself. It has been shown by Ludwig and his scholars that the secretion of urine is, generally speaking, proportional to the pressure of blood in the renal glomeruli, and thus the pressure would rise along with the tension in the vascular system generally. The contraction of the vessels which tonics produce will therefore raise the tension in the kidney as well as in other parts of the body, and thus aid in the elimination of the products of waste.

From what has just been said, then, it would appear almost that strychnia or nux vomica is one of the most valuable tonics which we possess. When combined with nitro-hydro-chloric acid it is perhaps one of the most efficient remedies that we can give for the debility which is so often noticed in warm weather, and when the ordinary tonics, such as gentian, columba, cascarilla, or quinine do not produce the desired results, the addition of a little nux vomica or strychnia to them may give us the wished-for effect.

ON THE CLIMATES OF AUSTRALIA, NEW ZEALAND, AND THE WEST INDIES IN LUNG DISEASES.

BY R. H. BAKEWELL, M.D.,

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So many mistakes are made in sending consumptives and others suffering from diseases of the lungs to the Australasian colonies, that it seems as if a few practical observations on the climates of these colonies would not be without use.

To begin with, although I have employed the term "the climates of Australia and New Zealand," there is in truth no similarity of any kind between them. The two places are as different as Calcutta and London as to their climates. Nor is the term "Australian climate" one to which any definite meaning can be affixed, although it is in popular use. The fact is that there are an infinite number of climates in Australia; and even in the colony in which I am at present residing, the difference between the temperature of different places on the same day is very marked. This will be more easily seen from the inclosed table clipped from the *Sydney Morning Herald*:—

The following information (taken from the daily returns prepared at the Government Observatory, Sydney) shows the maximum and minimum temperature and total rainfall during the past week at the stations specified:—

Stations.	Maximum and Minimum Temperature.												Total Rainfall.
	Friday, April 5th.		Saturday, April 6th.		Monday, April 8th.		Tuesday, April 9th.		Wdnesday, April 10th.		Thursdays, April 11th.		
Tenterfield . . .	74	48	73	52	69	50	70	50	73	55	69	51	0
Grafton . . .	77	45	93	50	94	53	85	52	86	52	84	43	2·02
Inverell . . .	...	...	80	53	79	54	79	53	72	51	76	50	0
Bourke . . .	82	56	89	60	93	68	91	63	...	...	85	61	0
Narrabri . . .	90	57	91	58	92	59	87	63	88	62	87	59	0
Armidale . . .	71	52	72	52	72	61	70	55	70	54	69	50	0·06
Gunnedah . . .	94	52	...	...	...	...	86	62	90	60	86	57	0
Tamworth . . .	...	...	...	...	...	...	...	...	...	...	...	...	...
Fort Macquarie . . .	74	41	76	61	77	63	75	63	69	63	76	57	5·65
Murrurundi . . .	73	49	74	50	75	49	71	55	71	60	72	50	0·20
Cassilis . . .	77	48	80	52	82	49	77	62	75	56	73	56	0
Muswellbrook . . .	80	52	81	53	83	53	83	61	79	60	79	52	0·11
Dubbo . . .	75	55	77	60	80	58	78	60	78	57	77	53	0
Mudgee . . .	89	55	89	58	95	56	85	60	85	58	87	59	0
Maitland . . .	70	52	79	58	77	59	73	63	74	61	75	57	1·64
Newcastle . . .	78	60	78	60	78	61	77	63	78	65	72	60	0·09
Orange} . . .	65	44	63	53	75	50	70	51	70	53	69	46	0
Bathurst . . .	75	43	77	45	78	47	71	54	71	48	72	49	0
Mount Victoria . . .	68	45	77	48	72	49	63	51	64	50	65	46	1·15
Forbes . . .	79	63	81	67	...	...	84	66	86	65	79	63	0
Sydney . . .	71	58	93	60	74	63	72	62	74	61	71	61	1·72
Wentworth . . .	78	47	84	52	92	56	94	59	90	62	89	57	0
Young . . .	...	...	...	...	...	...	78	52	76	53	73	60	0
Wollongong . . .	72	56	74	62	74	60	74	62	74	60	71	59	0
Moss Vale . . .	67	49	...	...	...	...	...	...	...	...	...	...	0
Euston . . .	80	47	82	48	85	45	93	64	91	62	85	53	0
Goulburn . . .	76	45	...	...	...	...	72	52	75	49	74	56	0·04
Wagga . . .	76	40	...	...	82	55	82	41	82	40	82	40	0
Cape St. George . . .	69	59	69	59	72	64	72	64	71	63	68	63	0·20
Queanbeyan . . .	74	50	77	55	79	51	78	52	75	53	76	48	0
Deniliquin . . .	74	44	79	49	85	58	87	59	83	58	85	53	0
Albury . . .	76	43	80	44	85	47	85	40	84	48	84	48	0
Bodalla . . .	71	50	98	51	63	55	83	54	83	54	79	53	0·15
Cooma . . .	73	42	76	35	82	40	78	40	75	49	76	40	0·01
Eden . . .	66	56	68	56	72	60	71	63	74	63	70	57	0·08
Gabo Island . . .	...	...	...	...	73	74	74	65	75	64	69	59	0

It will be observed that on the same day, the maximum may be as high as 94° in one place, and as low as 63° in another; while on the same day the minimum of another place may be 63°, and of another 41°. Now the week for which these temperatures are taken is the middle of April, autumn weather, and supposed to be cool. The weather has been hotter this week than it was last week. After the intense heat of the past summer, a maximum of 80° seems cool and pleasant.

Of course Queensland and the more northern parts of South Australia are much hotter than anything we have in New

South Wales, while Melbourne and the southern parts of Victoria are a little cooler than our general temperature.

The two commonest delusions about the Australian climate are that it is very dry, and that there is no malaria. There is no doubt that for the most part it is very dry, but it must be evident that all the thickly peopled districts must be well supplied with water. There can be no large town, and no well-populated agricultural district, unless there is abundance of water. The places where droughts are frequent are almost uninhabited. But whenever you have heat and moisture, there you will have, on low-lying lands at least, malaria. Malaria exists here, and that to such an extent as to modify the treatment of all acute, and many chronic diseases. In the part of New South Wales (near Newcastle) where I have lately resided, I have had as well-marked cases of bilious remittent as ever I saw in the West Indies, and malarious fevers of a very severe type appear regularly every autumn, some proving fatal. Neuralgia is very common, and a spasmodic asthma, which I believe to have its origin in malaria. The reason why malaria is not more severe is, doubtless, the extreme abundance of the Eucalypti, the resins and oils from which apparently decompose or neutralize the marsh poison.

As regards the climate of Australia for consumptive persons, or those suffering from chronic bronchitis or pneumonia, or from chronic laryngitis, even when cheesy deposits have occurred, provided no true tubercle has been deposited, there is no doubt that the winters would be beneficial. The summers are far too hot for invalids, the heat at times is dreadful, and when a hot wind blows is almost unbearable. Then the nights are hot, and the consequence is there is no refreshing sleep, while the myriads of mosquitoes of the most virulent kind render a mosquito-net absolutely necessary, though of course it makes one hotter. In the worst places and at the worst seasons in the West Indies, I never met with such virulent mosquitoes as they are here. They sting old residents as well as new comers. People smother themselves in smoke to drive them out of the houses, and it is often the only plan to go to bed as soon as it is dark to get out of their way. Now these

annoyances are very serious to an invalid, and especially if he is a stranger, and has no one to look after him. A single mosquito inside his net will keep him awake for hours, and perhaps prevent sleep all night.

Bugs and flees swarm here. There are in Sydney immense quantities of these pests, which are found, as far as my experience goes, in every hotel and boarding-house.

However, if a person can bear the voyage, if money is no object, and if there is any curiosity to see Australia, there is no doubt that a winter's residence here would benefit the great majority of persons who are suffering from the diseases I have enumerated. Only they should not attempt the long sea-voyage, but come out by the Suez route, either by P. and O. steamers, or in one of those magnificent vessels the *Lusitania*, *Chimborazo*, &c. The voyage in a sailing vessel, even a clipper, is for most people a mixture of sea-sickness and boredom. The first week or two they are sea-sick; all the rest of the voyage they are bored. Neither condition is good for invalids. On these sailing vessels also the ventilation of the cabins is often atrociously bad.

So much for those who think of going to Australia, and who have plenty of money. But let me most earnestly beseech my medical brethren at home, on no account to recommend any of their patients who may have to depend on their own exertions for a living to come out here, with the idea that they may improve their health and earn money at the same time. Life here is very fast, much faster than it is at home, and for every one except working men, it is much harder. Educated men are a mere drug—clerks are very badly paid, and for every vacancy there are fifty to a hundred applicants on the spot. The hatred of honest labour, and the contempt with which it is treated, induce vast numbers of working men to give their children an education good enough for a clerk, but which unfits them (as they think) for manual work. The consequence is swarms of half-educated youths, who are on the look out for clerkships, government “billets,”—anything in short which will prevent them from dirtying their fingers.

A “new chum” has no chance. It is therefore cruel to send out young men as I have known done many times, who in

addition to being strangers are in delicate health. They are fit for nothing here, and either die miserably in a hospital or are sent home, as I have sent dozens, disappointed, and not more improved in health than they would have been at home.

New Zealand, particularly Nelson and some parts of the North Island, is admirably suited for chronic lung cases. The climate is warm and sunny, without being so intensely hot as Australia, and the winter has many beautiful days on which the most delicate invalid can take outdoor exercise. Nelson has perhaps the most charming climate in the world: it is almost too fine. The town itself is not so healthy as it should be, owing to the presence of a huge muddy shore on to which the town sewage is distributed. The consequence of this is of course a good deal of enteric fever. But the port and the suburbs generally are unexceptionable. The scenery is exquisite, and the town itself viewed from the neighbouring hills, looks like a large garden, studded with buildings. The auctioneer's well-known description, applies literally to Nelson—the great objections to it are “the litter of the rose leaves and the songs of the nightingales.” The hedges are commonly formed of a small double rose, not the common dog-rose. Vines abound, orange and lemon trees flourish, and every fruit of temperate climates grows most abundantly. Peaches are so common that they are used to feed pigs with—they will not even pay for gathering.

There is plenty of good society, if the visitor can bring a few good letters of introduction. The Nelson club contains some excellent whist players. Several retired officers of the army and navy reside in the neighbourhood.

The North Island of New Zealand or Nelson should be selected as a residence; any other part of the Middle Island than Nelson would be too cold in winter, and exposed to biting winds coming over the mountains. Nelson is situated in Cook's Straits.

But for those who object to the long voyage and the distance from England, I would strongly recommend a winter in the West Indies. The distance is a mere nothing—the steamers are beautifully fitted up, with excellent tables, and every accommodation. If the patient suffers much from sea-sickness the

journey may be made *viâ* New York, where the traveller may recruit himself, and there take steam to St. Thomas. From St. Thomas the steamers of the Royal West India Mail Company will convey him to any of the islands.

The best for the invalid is undoubtedly Barbados. It is a coral formation, and so dry that all the prayer of the planters is for rain. The roads are dry ten minutes after the heaviest shower. The resident gentry are a highly educated, most hospitable, and courteous set of men. An old University man will find numbers of Oxford and Cambridge men amongst them. The best time to arrive would be by the end of September, or beginning of October. This would give him the whole of the winter in the tropics.

Yellow fever rarely makes its appearance in Barbados, and if it does a chronic invalid runs no danger from it. It is your florid, healthy, beer-and-brandy drinking Britons who die from yellow fever. Besides, it is almost confined to the barracks, and to low unhealthy places in Bridgetown.

Jamaica, I believe, would also be a good locality, but I have never been there, although I have visited and resided in nearly every other West Indian island. The French islands and those that were formerly French, such as St. Lucia, Grenada, &c., are not so suitable for invalids. The hotels are poor and bad; the sanitary arrangements atrocious, and the society very limited, and consisting chiefly of coloured people. The French Creoles are not fond of the English.

Trinidad, which is the subject of Canon Kingsley's "*At Last*," is a beautiful island, but as its first medical officer of health, I am bound to say that it is a most deadly climate for Europeans. Malarious fevers abound, in fact every one who goes there must take fever if they stop a few months, and it leaves its traces, as I can testify from personal experience, for years after one has left it. Still a flying visit might be paid to it, to see the Pitch lake, and the mud volcanoes, &c. It is only ninety miles from Barbados.

Were I in practice in England I should never send a patient to Australia or New Zealand, unless—(1) he were in any early stage of phthisis, or suffering only from chronic bronchitis with a phthisical tendency; (2) strong enough to bear the voyage;

(3) rich enough to go by the Suez route first class, and, (4) unless he had near relatives who would welcome him, and look after him at the Antipodes. Anything more dreadful than an illness in an Australian hotel, where all the servants are frightfully over-worked, the bedrooms are small, ill-ventilated, and without fire-places, I cannot imagine. Far better to go to a hospital at once.

Barbados, or a hill residence in Jamaica is infinitely preferable. The voyage is a mere nothing—attendance is cheap, the negresses make excellent, kind, and attentive nurses, there are plenty of good medical practitioners within reach, and the climate is not hotter than the Australian winter, and nothing like so hot as the Australian summer.

SYDNEY, N.S.W., *April*, 1878.

ON THE USE OF COLD COMPRESSES AND FRICTION.

BY DR. WILLIAM WINTERNITZ.

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IN my last paper I promised to give some examples to show that wet compresses were amongst the most quieting measures which could be used for nervous excitement, subduing the symptoms of irritation of the brain, cerebral congestion, and even furious delirium. In one case which several of my colleagues observed along with myself, during a course of severe typhus, the most violent symptoms of cerebral irritation came on.

The sleeplessness and delirium lasted for several days, and all possible sedative measures had been already tried in vain. Consent was refused to a regular antipyretic hydrophobic treatment, and I recommended that compresses to the legs should be tried. Shortly after their application, notwithstanding the slight temperature, the patient became quiet and fell asleep. This action continued for about half-an-hour after the first compresses had been applied, and then the symptom of cerebral irritation, delirium, rolling of the eyes, twitching of the face, grinding of the teeth, attempts to stand up and run, and automatic and aimless groping of the hands again occurred. The renewed application of compresses was followed by permanent quiescence, and shortly afterwards the patient again fell asleep. In such cases the compresses should always be renewed as soon as the symptoms begin to get worse. In another case of recent apoplexy the result was still more striking. For two hours ice had been applied to the head in order to lessen the symptom of irritation, which consisted of restlessness, constant turning and rubbing with the head, tension of the muscles of the neck,

twitching in the face, grinding of the teeth, groaning, and screaming, and clonic convulsions in the extremities. Shortly after the application of cold moist compresses to the feet, the patient became quiet, fell asleep, and all the symptoms just mentioned diminished.

I could enumerate many other examples of a like description, but as in most of them there are other indications demanding the application of other procedure, such as general abstraction of heat and augmentation of the secretions I will reserve these cases till I discuss combined hydropathic methods. I will now only give one case more, in which most of the applications which we have hitherto considered were simultaneously applied with good result. This is a case of headache, with cerebral congestion, and disordered menstruation. Miss V. L., aged twenty-five, and previously in good health, suffered for several years from frequent headache.

The pain was oppressive, being chiefly confined to the forehead, and accompanied by a failing of tension in both eyes. On coughing or sneezing pain became severe and shooting. On rising in the morning she often suffered from giddiness. All emotional excitement caused severe and annoying throbbing in the temples, and formication which was felt in the left arm up to the tips of the fingers as if the arm had gone to sleep. During the exacerbation, which never occurred at the time of the catamenia, reading and over-straining of the eyes became impossible. The lines in the page ran into each other, and light rings with dark borders floated up and down in the field of vision.

The face, forehead, and ears, as well as the conjunctiva, became deeply congested, the head was hot to the touch, the carotids throbbed forcibly, and the apex beat could be felt distinctly increased, although in its normal position. The menses were regular, but for the last year had been exceedingly scanty, and only lasted for two days. Besides this, no objective symptoms could be perceived. The congestive condition of the head and brain characterised by such well-marked symptoms as those above described ought to be combated by the following therapeutical measures, the reasons for which are readily perceived. First, in order to increase the tone of the cerebral vessels, and to render

them more capable of withstanding the rush of blood, wet compresses to the head at 12° and frequently changed, should be used. Secondly, immediately afterwards, in order to lessen the flow of blood to the cerebral vessels, thermal irritants should be applied along the vessels leading to the head in order to cause them to contract. For this purpose cold compresses should be applied along the front and sides of the neck, being changed before they have time to get warm. Thirdly, in order to slow the action of the heart and to lessen the force of its contractions, cold compresses frequently changed should be laid over the cardiac region. Fourthly, the desired result can be aided by a foot-bath of running water, which causes reflex contraction of the cerebral vessels. Fifthly, we should attempt to derive blood directly from the over-filled vessels of the brain by dilating those of a distant vascular area. For this purpose compresses to the legs should be employed. Sixthly, for a similar reason the activity of the intestines should be kept up by enemata or saline solutions. Seventhly, by general measures we must lessen the temperature of the blood by slowing the heart's action, and keeping up a more active current of blood to the muscles, as I will afterwards show. Finally, we may greatly aid our therapeutical endeavours by adopting dietetic regimen in reference to dwelling, ventilation, clothing, exercise, and food. All these measures must be distributed over different periods of the day and applied methodically in the proper manner. The mode of application in the case already described was as follows. In the morning cold compresses were applied to the head, and the eyes and face were frequently wetted in order to prevent congestion, and then a hip bath was given for eight minutes at 20° to 18° , with brisk friction of the surface in order to draw the blood to the vessels of the skin. Then moderate exercise in the open air was recommended. An hour afterwards the patient had breakfast, consisting of milk and vegetables. In the forenoon cold applications were applied to the head, to the front of the neck, and to the cardiac region, and afterwards a foot-bath of running water was used. In the afternoon, a slight, small, cold, enema was given and at bed-time compresses were applied to the legs. After this treatment had been continued for eight days, the patient became decidedly better, but her menstrual period

coming on, treatment was interrupted. Menstruation was somewhat more profuse than usual, and lasted four days. A continuation of the treatment in this manner until the next catamenial period but one brought about a complete and permanent cure. I will reserve a detailed explanation of the *modus operandi* of general proceedings, and of dietetic regimen, for another place, and will here only indicate the value of the combination of different applications.

We will now turn to another subject, and attempt to trace the way in which a thermal application to the whole surface of the body will influence innervation in general, the innervation in general and vaso-motor innervation in particular, and through it the distribution of blood in the body. Friction in a wet sheet and the wet pack are the two forms of treatment which we will first consider. First: Friction. The mode of applying this is as follows:—A sheet is dipped in water, more or less cold, and is more or less thoroughly wrung out, according to the indications which have to be fulfilled, and then wrapt round the body of the patient. The bath-man takes the sheet,¹ in such a manner as to hold the upper edge with his left hand, which edge must be so far folded together that when he holds it in his outstretched arms, it is not stretched but hangs down. In order to prevent congestion the face, head, breast, and axilla of the patient must be previously well wetted or washed, and a cold wet cap must be put upon the head. The bath-man now comes to the patient who is either standing or lying down naked, and wraps him once and a half or twice round in the sheet according as its breadth allows. It may be advisable to roll the patient in the sheet in such a way that one of the upper corners is held fast between the body and the arm. The sheet is then drawn across the breast to the other axilla, then over the back to the left shoulder, and, lastly, quickly laid round the right shoulder. The corner which the bath-man holds last in his hand is tucked in at the neck, and the sheet is also tucked in between thighs and legs, so that during the rub down it may lie as smoothly as possible upon the body and may retain its position. Everywhere that two surfaces of the skin would touch one another a layer of linen is pushed in between them. The

¹ For an adult this ought to be about seven feet long and five feet broad.

bath-man now rubs the palms of his hands up and down over the body of the patient with long, quick, and more or less powerful strokes. He must be careful that each part of the body is rapidly rubbed in proper sequence. It is frequently necessary, instead of friction, to use rapid pressure of the sheets on the surface. This is done by patting or clapping, alternately laying on and drawing away the palm of the hands with more or less force. On some parts of the body friction cannot always be borne. In such cases it should be combined with patting. If any part of the body, or the whole surface should become too hot, as shown by the sheet suddenly becoming too warm, and if the rapid abstraction of heat should be indicated, we can cool either the whole or any part of the body as much as we please by pouring cold water either over the whole sheet or any part of it which may be too warm. The abstraction of heat may also be regulated by bringing out the sheet more or less completely, so as to leave more or less water in it. A dripping sheet will abstract more heat than one thoroughly wrung out, and one of fine quality less than a coarse one. The mechanical stimulus produced by the same amount of friction and with the same temperature will be greater when the sheet is coarse than when it is fine. If rapid abstraction of heat is indicated, we use a coarse dripping sheet with brisk friction. Where we only wish to apply a powerful stimulus, but not to abstract much heat, we use the coarse sheet well wrung out. When the patient is irritable, and the skin very sensitive, fine sheets should be used for the rub-down. I have given the details of the method very fully, because ignorance of them prevents many a practitioner from effectually using this powerful therapeutical agent.

I will now consider the mode in which the rub-down acts. It is unnecessary for me to adduce new evidence to show that wrapping a person in a cold wet sheet powerfully stimulates the peripheral ends of sensory nerves. This stimulation will be very much more powerful than that produced by the mere local application of cold, as a much greater number of sensory nerve endings will be simultaneously irritated by the contact of the whole surface of the body with the thermal stimulus. This more powerful impression will be more deeply felt by the

central nervous system, and a greater and much more distinct reflex action will be produced. The first objective symptom to be observed is a marked change in the respiration, according to the varying sensitiveness of the individual subjected to this method of treatment. The respiration is either arrested in a convulsive inspiration, which quickly passes into rapid and violent respiration, or, in less sensitive persons, rapid and deep inspirations and expirations occur at once. It is only when the respiration has been abnormally quick before the rub-down that it becomes slower during the operation, but the depth of each inspiration is always considerably increased. The next noticeable effect of the rub-down is an alteration in the frequency of the pulse. This appears to depend, like the alteration in the respiration, upon reflex stimulation of the medulla oblongata, which acts upon the vagus roots and the vagus nerve, rendering the pulse slower, just in the same way as direct electrical irritation of the vagus or medulla would do. Pleniger tested the effects of a rub-down on a hundred persons between the ages of ten and twenty-four with the following results:—A rub-down with sheets dipped in water from 10° to 18° R. slowed the pulse, and quickened the respiration. If the pulse had been near or over one hundred per minute before the rub-down, it fell on an average twenty beats in two minutes, while the number of respirations rose five per minute. Pleniger explains this action also by reflex stimulation of the vagus roots, and of the respiratory centre. According to my observations the diminution in the pulse-rate and the quickening of the respirations cannot be well numerically settled, as they depend upon too many individual conditions. The general result just mentioned can however be confidently predicted. That the effect just mentioned does not depend upon the abstraction of heat is shown by the circumstance that it occurs before any alteration of the temperature of the body or any great abstraction of heat can take place. The lowering of the temperature has a similar effect, but this makes itself felt at a later period. These actions, however, are not the only ones produced by a rub-down. Without here taking into consideration the effect of the abstraction of heat as such, the thermal stimulus applied to the whole surface of the body, and especially

that combined with the mechanical effect of the friction, produces still other results. First, then not only is the medulla oblongata stimulated, as appears from the most superficial observation, but other nerve centres are also excited and their functions increased. Among these are the vaso-motor centre, and the ganglia in the peripheral vessels, which are much more directly influenced than is it. As I have already mentioned, in discussing the local effect of cold on the skin, contraction of the cutaneous vessels is produced by the cold at the moment of application. The diminution in size of the vascular system produced by thus driving the blood from the periphery might easily, as I have before shown, produce serious passive congestion of internal organs if no precautions were taken against it. Such precautions must therefore precede the application of the rub-down, and as congestion of the brain might be specially injurious, we must prevent it by increasing the tone of the cerebral vessels by washing the head with cold water or applying cold compresses to it, and by wetting the throat, the nape of the neck, and the back. If these parts of the body are not cooled to a sufficient degree and for a sufficient length of time, it often happens that a rub-down causes heat in the head, headache, and symptoms which indicate an increased flux of blood to the head. Even such patients as are careless in making observations on themselves soon find that a rub-down does them no good, but only excites them. But if the rub-down is properly performed, and if the thermal and mechanical stimuli produce much dilatation of the vessels of the skin, those results which Schüller describes must follow. The capacity of the vascular system is increased by dilatation of the vessels of the skin; the tension in the vessels falls; more blood is required to fill the cutaneous vessels. This must needs be drawn from internal organs, and must to some extent empty the vessels of the head and brain. It is only thus that we can explain the observation of Schüller that in a cold rub-down the vessels of the pia mater in the animal upon which he was experimenting contracted, the brain sunk in, and the respiratory movements in it became indistinct. The mechanical influence of friction itself must not be disregarded in judging of the action of this means of cure. Here mechanical stimulation of the nerves, the

influence of this upon the vaso-motor system, the mechanical aid to the circulation, and the influence upon the formation and circulation of the lymph must all be taken into account. Finally, the effect upon the function of the skin, and especially upon the insensible perspiration, must be considered.

Friction has a peculiar stimulant action on the nervous system, it aids the thermal stimulus, and produces a quicker relaxation of the primary contraction of the skin and of the cutaneous vessels than would follow the application of the thermal stimulus alone. This is proved by the fact that the skin remains very much longer pale when the body is simply rolled in a cold wet sheet than when friction is applied at the same time. The contraction of the skin is often only diminished by combination of the thermal and mechanical stimuli. The contraction of the muscular structures in the skin can also be relaxed by these means, even when it is dependent upon other causes than the application of cold. The most striking example of this is the cold stage of ague which can often be cut short at once by vigorous rubbing in a cold wet sheet. The peculiar action of the wet rubbing upon the surface of the body consists less in direct abstraction of heat than in an alteration in the mode in which heat is given off. Its influence upon tissue change and secretions will be discussed by and by. We will now proceed to consider the therapeutical value of this means of cure from the various points of view already mentioned. The rub-down in a cold wet sheet has a wide sphere of action, for to a certain extent it comprehends all the factors composing a regular water cure. On this account it is quite sufficient of itself to effect a cure in many diseases. The sudden contact of the cold wet sheet with the whole surface of the body produces a strong nervous stimulus. This can be increased by taking measures to heighten the sensibility of the nerves before its application. This, as appears from the rules already laid down, is best done by increasing the temperature of the surface, for the stimulus will be augmented to the uttermost by the contrasted action of different temperatures. The surface of the body is warmest when in bed before rising in the morning, for loss of warmth has been prevented by the bad conductors of heat with which the body has been surrounded and

covered in bed. For this reason moist friction is much more efficient when applied to the body under such circumstances. But even the warmth of the bed is not sufficient in certain persons to allow of a cold rub-down being employed. To this class belong anæmic individuals, and those who produce heat slowly, and those who have an irregular distribution of heat and always suffer from cold hands and feet, and who have always a cold skin even after a night spent in bed with plenty of covering. In such cases we must either find some means of accumulating heat, or the surface must be directly warmed. This end may be attained by carefully covering the body with bad conductors of heat, such as blankets and feather beds, or by applying the wet pack for about half an hour or an hour until the surface of the body is uniformly warm, or by a vapour bath for a few minutes. Raising the temperature of the surface increases the irritability and susceptibility of the peripheral ends of sensory nerves, and so the stimulating action of friction upon the body prepared in this manner is much greater than it would otherwise be. This mode of proceeding is also much less trying to the patient, as the cold wet sheet only takes away the heat which has been accumulated on the surface of the body, and may be so applied as not to reduce the temperature below the normal. This is of great importance when we wish to get the action of thermal stimuli, as in anæmic and weakly persons who have little power of producing heat. In this way disturbances in sensory and motor nervous tracts of the most varied kinds may be removed through the action either direct or reflex of the cold wet friction on the sensory nerves of the skin.

I have already shown how a low temperature may alter the rapidity of conduction and the power of perception in nerves of feeling and sensation. Friction also, as Türk showed, also influences these structures. He was able, by lightly rubbing the surface, to alter at will the extent of the affected places in persons suffering from local anæsthesia. The experiments which have been made with methodical rubbing and massage in cases of hyper-æsthesia and anæsthesia and of inflammation clearly show that we must not forget the mechanical factor in estimating the healing power of a wet rub down. We will by

and by consider this factor more fully, but enough has been already said to make it appear probable that friction alone may lessen or remove many nervous diseases, such as anæsthesia, hyper-æsthesia, neuralgia, paræsthesia, and paralysis. The action of the friction upon pulse and respiration already described is also produced through the nervous system.

What semeiotic importance are we to attribute to the slowing of the pulse and acceleration of the respiration which occur during cold friction? In general there is a certain constant relation between the frequency of the pulse and respiration. For every respiration has generally a definite number of pulse beats. If now the number of respirations be increased, while those of the pulse become fewer, there will be a smaller number of pulsations for every respiration. Thus, every wave of venous blood driven by the systole of the heart into the lungs will remain longer in contact with the air in them. In addition to this, in consequence of the action of the cold upon the periphery, the respiration is increased in depth and frequency and a greater and more complete inspiration of carbonic acid occurs, so that the air in the lungs becomes richer in oxygen and poorer in carbonic acid. In consequence of this, the interchange of gas between the air in the lungs and the blood is more complete, and therefore the blood becomes freer from carbon and richer in oxygen. The slowing of the heart's action depends, first on reflex stimulation of the vagus, and secondly on diminution of the blood pressure by dilatation of the vessels of the skin and consequent diminution in the resistance of the circulation. The individual pulsations of the heart are, however, fuller and stronger, and thus the slower action is compensated. At each systole a greater amount of blood is thrown into the pulmonary artery and aorta. The direct consequences of friction with a cold wet sheet, continued until the skin becomes red, are: higher oxidation of an equal amount of blood, stronger though slower pulsation of the heart, lower tension in the arterial system, mechanical assistance to the circulation, and altered distribution of blood, consisting in diminution of the quantity of blood in internal organs, with increased quantity of blood in the skin. Increased absorption of oxygen into the blood will stimulate the process of combustion in the body. In conjunction with

a powerful nervous stimulus, therefore, this action of friction is a so-called tonic one. The formative processes in the body are increased at the same time that increased destruction and more rapid disorganization of the tissues in the body occur, and therefore there is a greater need for food. Hence we find that a wet rub down has a most beneficial action in disturbances of nutrition and digestion from various causes.

The most important therapeutical factor in the process is the altered distribution of blood. The vessels of the whole surface of the body, when dilated by thermal and mechanical stimuli, can and must take up a much larger quantity of blood. In consequence of the increased capacity of the vascular system, the pressure within it sinks. In consequence of the increased flow to the periphery, the quantity of blood in the internal organs must diminish, and there is thus a real derivation of blood from them to the surface of the body. Cold friction is thus indicated in all hyperæmias or congestions of internal organs; and indeed in all cases where it seems advisable to diminish an excess of blood in any internal organs. The various disturbances of the circulation consequent upon organic disease belong to this class of cases. Hence a rub down is useful in valvular disease of the heart, and in those diseases of the lungs where hyperæmia and stasis occur in the pulmonary circulation, such as emphysema, pulmonary congestion, and catarrh. Its effect is also beneficial in catarrh of the stomach and intestines. It is only in inflammatory affections that the rub-down is less to be recommended, on account of the shaking which is its necessary accompaniment. The narration of one or two cases may render this plainer. The first is one of mitral stenosis and regurgitation with ascites, anasarca, hydrothorax, and albuminuria, where, under the influence of rubbing down and stimulating compresses to the feet, combined with a milk diet, the balance of the circulation was restored and the dropsy removed. Mr. H. T., an engineer, aged 43, had recovered from an attack of acute rheumatism of two years' standing. Since then he has suffered from palpitation and shortness of breath. Some months before I was called to him, his feet began to swell, at first only towards evening. By and by the swelling ceased to disappear completely, even in the horizontal position, and after a night's

rest. Increased difficulty of breathing rendered even moderate exercise impossible, so that the patient was confined almost constantly to bed or to his chair. During the last few weeks the belly was also swollen; there was troublesome cough, and several times bloody sputa. When I saw the patient in 1873, I found him sitting on the sofa; he had a swollen earthy-coloured face, blue lips, and the point of the nose cool and cyanotic, and the expression of the face exceedingly anxious. The thighs and legs were much swollen, and the skin upon them was cedematous and hard as a board. The skin of the thorax and upper part of the body was also highly cedematous. The cardiac dulness, opposite the fourth rib, extended beyond the right margin of the sternum on the right, and beyond the nipple line on the left. The apex beat, indistinct and wavy, was felt a little outside of the left nipple line, between the fifth and sixth rib. On auscultation, two long, rough, sawing murmurs were heard at the apex, and two dull sounds over the aortic valves. The second sound was much accentuated over the pulmonary artery. The veins of the neck were somewhat distended, but there was no pulsation visible in them. At the lower part of the thorax, on both sides percussion posteriorly was somewhat impaired, and respiratory sounds were absent. Over the remaining portion of both lungs percussion was clear, and there was harsh vesicular breathing with occasional moist râles. The liver extended more than an inch and a half below the margin of the ribs, the spleen could be clearly felt to be enlarged three inches below the umbilicus. In the horizontal position a curved (?) line of dulness began three inches below the umbilicus, reaching a little higher on either side towards each hypochondrium. On changing the position of the patient the dulness changed in such a way as to include the most dependent parts of the abdomen. The pulse was 108, small, irregular, and hard; respiration was frequent and shallow, the urine was scanty and turbid, and contained a quantity of albumen. There could be no doubt about the diagnosis of severe mitral stenosis and regurgitation. The insufficiency of the mitral valve was also very imperfectly compensated, as appeared from the symptoms of congestion in the pulmonary circulation, as well as the cyanosis, shortness of breath, dropsy, albuminuria, and the quick, small,

hard, and irregular pulse. The only means of assisting compensation in such a disturbance of the circulation is to try to diminish the pressure and tension in the pulmonary circulation. It is only thus that we can exert any beneficial influence upon the regurgitation of the blood to the heart and upon the congestion in the venous system, especially in the portal vein. It is only when the action of the heart is rendered slower, and the individual beats at the same time more powerful, that more blood is driven at each systole into the aorta, and perhaps less regurgitates into the left auricle, and at the same time a greater *vis a tergo* aids the venous circulation. A proper mechanical friction may well benefit the regurgitant movement of the blood and, as I have already said, a brisk rub-down in a cold wet sheet will fulfil all these indications. If we succeed by this method in contracting the vessels of the skin at the moment of application, and causing reflexly more powerful action of the heart with deep inspiration and expiration followed after a little by dilatation of the vessels of the skin, we must needs render it easier for the left ventricle to empty itself into the aorta. The diminished resistance to the flow of blood in this direction must produce diminished regurgitation into the left auricle; the pulmonary veins can therefore empty themselves more easily into it, the congestion in the right side of the heart is diminished, the circulation in the pulmonary vessels is accelerated, and the venæ cavæ empty themselves more readily into the heart. The deeper respirations which are reflexly excited by the thermal stimulus to the skin similarly aid the circulation; the heart beats are reflexly rendered slower and stronger, and the friction will mechanically aid the flow of the venous blood.

There is still one indication which a rub-down can fulfil in such a case. Weyrich has shown that by the mechanical action of friction the excretion of water through the skin can be increased sixty per cent., or more. The rub-down can thus fulfil the indication for increased excretion of water which is presented by dropsy. The result showed that in our case moist friction completely fulfilled all these theoretical requirements. The patient was first of all equably warmed by being rolled for a considerable time in blankets and coverlets: next the head, neck, and face were washed, and the back and breast were wetted in order to prevent congestion,

and the patient was then wrapped in a moist but tolerably well-wrung-out sheet, at 12° R. and briskly rubbed for three minutes over the whole surface of the body. The sheet became warm, tolerably equably all over, and only the feet required a longer and brisker rubbing. The skin, especially on the trunk, became tolerably equably reddened, and not in spots merely. The patient soon recovered from the first shock of the application, began to breathe more deeply and slowly, and experienced an agreeable general feeling of warmth. Compresses were applied to the legs, and the patient, who could only stay for a short time in a horizontal position, was put to rest in an easy chair and covered with blankets. The room was well ventilated, and care was taken that the patient should be drawn into the sunlight as often as possible, and a rigid milk diet was insisted upon. Lukewarm skim milk, previously boiled, was given at intervals of two hours to the exclusion of all other nutriment at first. At first only one-tenth of a litre was given at a time, but every day the quantity was increased by one-tenth more. Under this treatment the quantity of urine gradually rose from day to day, the difficulty of breathing became less, and the albumen in the urine rapidly diminished. The pulse became slower, stronger, and more regular. On the fourth night after commencing this treatment the patient was able to remain in bed all night and slept for the greater part of the time. After fourteen days the dropsy was completely gone from the cellular tissue and serous cavities. The difficulty of breathing only came on upon exertion, the strength rapidly increased and the patient quickly improved. After four weeks he could take tolerably long walks, a plain but nutritive diet could now be borne, and he was able to go about his business. The rub-down was continued, but only in the morning. The cardiac lesion could still be recognised by auscultation and percussion, by the audible murmur at the mitral valve, by the somewhat accentuated second sound in the pulmonary artery, the shape of the cardiac dulness, and the form of the pulse curve. The subjective symptoms had almost entirely disappeared. Two years later the patient died from pneumonia, brought on by exposure to the rain. The result of the rub-down in this case was so striking that I think further comment upon it is unnecessary.

I will now give a second case, not less striking, of asthma with pulmonary emphysema and bronchial catarrh, in which treatment had been previously of little service. Mrs. M. L., aged 56, had suffered for several years from cough and profuse expectoration. The patient had been sent to many different baths and winter resorts. She had repeatedly visited Gleichenberg and Ems without any other result than a temporary improvement. Upon the whole the difficulty of breathing constantly increased. In 1874, as she came back about the end of the summer from Gleichenberg, where she had been under the care of Professor Löbel, she had the most violent asthmatical attacks on the slightest movement, could not ascend a stair, and had violent cough. At this time the patient consulted me. She was a little woman, with somewhat swollen face, muddy complexion, and bluish coloured mucous membranes. The difficulty of breathing could be recognised in the expression of the face. She became quite breathless on speaking a few words. Respiration was plainly audible; short, gasping, and frequent. Every fit of coughing seemed as if it would asphyxiate her. She could not lie down, and spent the night sitting up in bed. The neck was thick and short, and the jugular veins were swollen to the size of the little finger. The supra-clavicular region was swollen, projecting; percussion over the lungs, and everywhere clear and full, but not tympanitic. The lower margins of the lungs extended beyond the normal limits. The cardiac dulness could hardly be perceived. The liver was somewhat large; the respiratory sounds were indefinite over the back and especially at the lower part; there were coarse mucous râles. The apex beat was not perceptible, the cardiac sounds were muffled. There was no murmur. The second sound was accentuated over the pulmonary artery, the pulse was 90, small and weak. There were traces of albumen in the urine. The feet were cold, cyanotic, but not cedematous. I confess that I hesitated to see this patient, because some doctors who had been previously consulted had decidedly advised her against a water cure. At her urgent request, however, for she saw no other means of relief, I treated her. The indications to be fulfilled here for the relief of the patient were that the respirations should be reflexly rendered deeper, that the circulation should be slowed, that the pressure

of blood in the pulmonary circulation should be diminished by dilatation of the vessels of the skin, that the interchange of gas through the skin should be increased in order if possible to throw less work on the lungs, and finally that the bronchial secretion should be rendered thinner, and expectoration facilitated. All these indications could be fulfilled by a rub-down in a cold wet sheet, and compresses round the thorax. We have already described how the rub-down acts as a thermal and mechanical stimulant. In another place I will explain the action of compresses to the thorax in lessening the irritation of the cough, in aiding expectoration, and driving blood from the lungs. Every morning and evening the patient was briskly rubbed for three minutes in a sheet tolerably well wrung-out at 14° R. At night before going to bed a so-called stimulating compress, well wrung out, of perfectly cold water at 8° and thoroughly well covered with a dry cloth, was wrapped round the thorax in the way that one usually puts on a plaid. The result of every rub-down was very favourable. Immediately after it the difficulty of breathing completely disappeared for a short time. The effect of each succeeding rub-down lasted for a longer time than the preceding one. In less than a fortnight the patient's condition was so much improved that she could take longish walks, could walk upstairs, and could converse briskly without being hindered by difficulty of breathing. The asthma seemed to have completely disappeared, and the patient's condition, both subjective and objective, left little to be desired. After this treatment had been continued for several months she became better than she had been for many years, and except a slight catarrh, which manifested itself by a little expectoration of mucus in the morning, no trace of her grave illness remained.

I am now choosing diseases of the lungs especially as examples of the beneficial action of this treatment, because there is such a general prejudice against hydropathic measures in such cases. Experience has however long shown me that when the indications for treatment can be more fully fulfilled by hydropathic measures than by any other, one must not allow oneself weakly to abstain from following them out.

The following case strongly supports this view. It is one of repeated pulmonary catarrh and chronic pneumonia with result-

ing consolidation, in which climatic treatment had been tried for five years. Charles K., aged eleven, had suffered since his sixth year, from enlarged glands, eczema behind the ears, and frequent pulmonary catarrh; sometimes beginning with fever, and several times indeed resulting in circumscribed pneumonia, especially of the apex. The boy was delicate, weakly, and very much reduced. He spent five successive winters in various healthy resorts in Southern Tyrol and Italy.

The climatic treatment had not in the least improved his tendency to catarrhal and inflammatory affections of the lungs. These processes often ran an insidious course, resolution was incomplete, and several consolidated spots remained behind. When I saw the boy for the first time in the autumn of 1875, I found on the left side superiorly short and indistinct respiration, and on both sides general pulmonary catarrh. Every evening the boy became feverish, and perspired during the night. He had no appetite, and was anæmic, and much emaciated. His sufferings were increased by violent cough and severe attacks of asthma, which were eased by respiring rarefied air in one of Schnützer's inhalation apparatus. His parents having lost heart, had decided not to go again to any health resort, but to spend the winter in Vienna; and one attempt more was to be made at treatment by means of the water cure. The indications here were; First, to lessen or prevent the febrile symptoms; Secondly, to remove the habitual congestion of the lungs which increased the tendency to catarrhal and inflammatory affections; Thirdly, to harden the skin by diminishing the reflex excitability of the peripheral sensory nerves and the habitual cutaneous congestion, in order that the slightest cooling of the skin should not produce reflex catarrhal affection of the lung; Fourthly, to improve the digestion and blood formation, and thus counteract the emaciation and anæmia. I will by and by state more fully how dilatation of the vessels of the skin, and acceleration of the circulation in them affects the temperature of the body and influences the febrile state. I may here remark that a rub-down was at first sufficient to lower the temperature in the rectum to the normal. After a few days, however, a febrile attack came on, and along with it infiltration of the left lobe of the lung became clearly perceptible. Notwithstanding

the unhealthy condition of the organ in which this inflammatory process had occurred, I considered it necessary to combat the fever energetically. This was done by wet packs changed several times and varied by a rub-down. By this means the fever was lessened ; and I attempted to influence the severe and general catarrh and inflammation by stimulating compresses to the chest. After six days no consolidation could be any longer perceived, and the asthmatical attacks ceased. The rub-down in the morning at 15° R. and the stimulating compresses on the chest were now alone continued. The appetite improved, the weight of the body rapidly increased, and the cough diminished. The treatment was aided by careful ventilation, but chiefly by milk diet. After a few weeks the boy could be sent out daily and in all weathers into the open air. Throughout the whole of the severe winter, the first which he had spent in such a high latitude, he was not confined for a single day to his room. He increased more than twelve pounds in weight and was able to make up for the deficiencies in his education due to his long illness. It was only the intelligence of the boy's relations, and the moral support given to my treatment by Dr. von Fuchs, that rendered it possible for me to carry it out thoroughly and obtain this happy result.

I will now give another case of a girl of eighteen in whom the attacks of coughing were due to neurosis : Miss A. v. B., a tall delicate girl, who suffered from irregularity in her menstruation, and for several years almost without exception had been subject to one or more attacks of asthma daily. These were preceded by symptoms of congestion in the head, and consisted in continuous and peculiar fits of coughing, lasting for one or two hours or more. They were brought on by a feeling of tickling and constriction in the larynx and had a convulsive character consisting of whistling short inspirations, and prolonged audible expirations. Physical examination showed both lungs and heart to be normal. There were tender points on the cervical and dorsal vertebræ. A wet rub-down, and exclusively milk diet, removed the attacks permanently in two days. In this case the exceedingly prompt action must be ascribed to the effect of the thermal stimulus on innervation.

Reviews.

Lectures on the Diseases of the Nervous System. By SAMUEL WILKS, M.D., F.R.S. London: Churchill, 1878.

THIS volume contains lectures delivered about ten years ago and published at the time by a periodical. They bear the marks of a careful revision, and the author has fully brought them up to our present state of knowledge. The field they cover is wide, embracing all the nervous disturbances, organic and functional. The standpoint of the author is mainly clinical, and throughout we are impressed by the personality of the work. Whatever the author owes to the study of other writers has been so thoroughly assimilated and fertilised by individual observation that he has been able to cast it into a homogeneous whole which pleasantly contrasts with the patchiness of so many writings.

In the preface Dr. Wilks warns us that he has not aimed at producing a systematic treatise nor framing a systematic view of nervous diseases. Accordingly we do not find that sharpness of definition nor that proportion in the treatment of the different subjects which he otherwise would have observed. But wherever he dilates upon any topic of special interest, he is excellent. The phenomena of aphasia are very clearly described; in the functional disturbances, epilepsy, hysteria, the sympathetic diseases, Dr. Wilks finds a congenial field for his power of happy expression and illustration.

Some general remarks on remedies are appended in which electricity occupies a prominent place. Some confusion arises from the fact that Dr. Wilks uses the term "Galvanism" generically instead of keeping to the proper meaning of the term, which is synonymous with "constant current;" whilst the denomination of induced or "interrupted" current should be strictly reserved to "Faradism." The qualitative alterations characteristic of the reaction of degeneration are hardly mentioned. Indeed from a statement at page 274 we might be led to infer that their discovery was due to a Mr. Sandy.

But these are specks upon a bright mirror. We do not know of any writer who so successfully *jungit utile dulci* on the subject of nervous diseases. These, we are told, constitute to many students the driest and most repulsive forms of malady: this view will be shared by none of Dr. Wilks's readers.

Influence of Climate in Pulmonary Consumption. By CHARLES THEODORE WILLIAMS, M.D., F.R.C.P., Physician to the Hospital for Consumption at Brompton. Smith, Elder, & Co.

THIS work, coming from the pen of a physician engaged in active practice, and free from any local bias or prejudice, is one well worth the perusal of both doctors and patients.

The consumptive invalid will do well to attend to what Dr. Williams says about hot latitudes. It appears that in hot climates, such as the littoral of Peru, the West India Islands, and the island of Tahiti, consumption may assume a degree of virulence and a rapidity of course hardly ever witnessed in the British Isles.

In cold climates consumption takes more of an inflammatory or catarrhal character, and is not such a deadly and dreaded scourge to the population as in the hot climates.

The very beneficial action of the elevated region of the Andes over consumption is illustrated by a well-selected case, that of a Swiss clockmaker, who, coming of a very consumptive stock, was attacked by the disease while keeping a shop at Panama. The disease progressed, and, following advice, he travelled to Quito, in the Andes, 9,500 feet above the sea-level; and here he remained six months, at the end of which time he had entirely regained his health. On returning to Panama he was again brought down by a return of his disease, and again cured by a return to Quito. On the occasion of a subsequent relapse, after an unwise descent to Jacna, Dr. Guilbert found this man looking more like a corpse than a living being, suffering from fever and night sweats, diarrhœa, cough, and profuse expectoration. Cavities were evident in both lungs, and crepitation scattered over their bases. Soon after this Dr. Guilbert met his patient at La Paz, the capital of Bolivia, 13,500 feet above the sea-level: the cough and diarrhœa were gone, and the patient and doctor enjoyed a good many long mountain walks together.

We may here remark that the great interest and value of Dr. Williams's book lies in the fact of the author giving the effects of various climates on invalids in various stages of consumption. This is just the kind of observation that is wanted to supplement the tables of temperature, atmospheric pressure and rainfall, that we usually find making up so large a part of ordinary works on climate. We will take an example of a well-known English

health resort, and examine it from the two points of view just indicated. "Torquay has the highest winter temperature in England (see Mr. Vivian's tables) and excepting Penzance, the greatest equability. The average rainfall is small, and mean winter temperature 44° F." This all reads very well, but let the reader pass on to page 70, where he will find that "at Torquay a larger proportion lost appetite, and from bilious or other derangements of the digestive system were unable to persevere in the use of that most important drug—cod-liver oil." Diarrhoea, too, was more prevalent.

The general rules at the close of the book respecting the climatic treatment of consumption, if not presenting any novel ideas to the reader, are yet well worth the study of all who take interest in the subject. We may in conclusion remind the reader that Dr. Williams's book is a reproduction of the excellent Lettsomian Lectures given by him before the Medical Society of London in 1876.

The Journal of Physiology. Edited by MICHAEL FOSTER, M.D., F.R.S. Macmillan and Co.

EVERY year, as medicine becomes more and more of a science, its dependence upon physiology is more deeply felt and more generally acknowledged. The present journal, containing as it does many new facts which may have the most important bearing on the future of medicine, will be welcomed by many medical men, as well as by those who, devoting themselves entirely to the study of physiology, will find this journal simply indispensable. The first two numbers contain articles by English, American, and German authors, embracing subjects in every department of physiology, and showing the rapid progress which physiological science is now making, particularly by the advances which have been made in the investigation of one subject, viz., the pigments of the retina, during even the short time that one number was passing through the press. The editor has obtained the co-operation in this country of Professor Gamgee in Manchester, Professor Rutherford in Edinburgh, and Professor Burdon Sanderson in London; and in America, of Professor Bowditch of Boston, Professor Martin of Baltimore, and Professor H. C. Wood of Philadelphia. The first two numbers contain articles on original researches in almost every department of physiology, from the lymph-heart of the frog to Fechner's law of the perception of sensations.

One of the most interesting articles to the general reader will be that of Professor Kühne, of Heidelberg, on the stable colours of the retina, but medical men will probably be more interested in such a paper as that of Stirling on hyperplasia of the muscular tissue of the lungs, of Ringer and Murrell on the action of

potash salts, of Gaskell on the vaso-motor nerves of muscle, of North on the effect of starvation and labour upon elimination of urea, and of Ott and Field on sweat centres. We cannot here attempt even to mention all the points of interest in these papers; we will simply notice one or two, and leave our readers to peruse the papers for themselves. Dr. Stirling's paper is chiefly interesting on account of the aid that it may give to the pathologist who investigates spasmodic asthma, while Dr. Gaskell's communication throws much light on the *modus operandi* of blisters in cases of atrophy of the muscles. He had previously shown that stimulation of the motor nerve of a muscle caused its vessels to dilate, so as to allow the blood to circulate more freely through it, and supply it with nutriment and oxygen during the period of contraction. He has now shown that the same result takes place when the muscle is thrown into action reflexly by stimulation of a sensory nerve, and that it is not even necessary for a contraction to take place, the vaso dilating nerves being distinct from the ordinary motor fibres. Thus, when an animal is poisoned by curare, irritation of a sensory nerve will cause a free flow of blood through the muscles which would have been thrown into action by irritation of the nerve had the animal not been paralysed. There is no reason whatever to suppose that the same action will not occur in a muscle paralysed by other causes, and we can now understand how a blister applied to the skin over a paralysed muscle will cause reflex dilatation of the vessels of the muscle, a free current of blood through it, and restoration of its functional activity.

Drs. Ringer and Murrell have re-investigated the action of potash salts, and find that potash is not simply a muscular poison, but that it paralyses all nitrogenous tissues, the reason of its action being that it has an equal affinity for all protoplasm, and destroys tissues in the order of their vital endowments. It is for this reason that it affects the heart, and not from its special action upon that organ.

Dr. Ott and Mr. Field narrate several experiments, confirming the fact already known that sweat glands have secretory nerves like other glands, and showing that deficient aeration of blood excites these centres and produces sweating. They also make some interesting observations on the effect of excess of carbonic acid in causing sweating, and cases of reflex localised sweating, both in health and disease.

These few remarks will indicate the interesting nature of those numbers of this journal which are already published, not only to pure physiologists, but to all medical men who have any knowledge of physiology, and who appreciate its value as an aid to medicine.

Clinic of the Month.

A Means of Lowering the general Temperature.—

Mr. Spencer Wells, in his lecture on the diagnosis and treatment of abdominal tumours, states that as a means of lowering temperature in cases when it has risen after ovariectomy, he has tried aconite in small doses, quinine in large doses, salicylic acid in the form of salicylate of soda, in fact, almost every medicine that has been suggested as effecting this purpose, but all these trials have ended in disappointment. He has, however, succeeded distinctly in lowering temperature and in keeping it low by the application of ice or iced water to the head. The first trials were made after a suggestion of Dr. Richardson, by putting an ice-bag round the neck. Dr. Richardson believed that by iceing blood that went through the carotids to the brain, and blood that came back through the jugulars, we should directly lower the temperature of the brain itself; and probably it may have been done experimentally, but in practice it was not found easy to do. It was difficult to keep any kind of cravat or collar that was tried, filled with ice, round the neck of the patient; it slipped off, and the old India-rubber bag or ice helmet, so well-known in lunatic asylums, had to be resorted to. After a time Mr. Thornton combined a particular form of cap which answers the purpose extremely well. A pail of water with a large lump of ice in it is placed above the bed of the patient and the stream of iced water runs through the cap, which is formed of a coil of india-rubber tubing lined with linen. That is placed upon the patient's head, and it is made of different sizes and shapes to fit the patient; the other extremity of the tube is put into a second pail at the side of the bed, and by this means the head is iced. The effect in lowering temperature is very marked, the thermometer in almost all instances indicating a fall of temperature within an hour. If the temperature be rising it is checked, and if very high it can be lowered, and so time is gained for the recovery of the patient. Many of the evil effects of ovariectomy appear to be due to the fact that the temperature of the body is for a time too high. The brain receiving blood of a temperature $5-6^{\circ}$ higher than it has been accustomed to, does

not give its orders to the secreting organs as it should do, and they all suffer in consequence. The kidneys do not act, there is no action of the bowels, and all the processes of nutrition and secretion suffer. (*British Medical Journal*, July 13.)

Salicylic Snuff in Hay Fever.—Mr. W. J. H. Wood, in a case in which the previous year he had tried everything, found immense relief followed the use of snuff composed of pure salicylic acid. This was suggested to him by the fact that relief is often afforded by the topical application of solution of quinine, and, indeed, in this case, he first combined quinine with the salicylic acid, but the good result is now maintained much more agreeably by the salicylic alone, of which the patient snuffs about ten or fifteen grains daily. He speaks most highly of this white powder. As this observation extends to only one case, no conclusions can be drawn from it, but it will be a suggestion acceptable to those who are baffled by this very obstinate complaint. (*British Medical Journal*, July 20, 1878.)

Medical Uses of Carbolic Acid.—Dr. Peter Eade, in a clinical lecture on this subject, after referring to the antiseptic properties of carbolic acid, states that the diseases in which he has found that acid especially useful are—1. All that class of local, festering, pustulating diseases of the skin which are at once so common and so difficult to cure. It includes all kinds of pustules, boils, and carbuncle; sycosis, pustular acne, and festering ringworm. 2. Such strumous sores, especially of the neck, as come under the care of the physician. 3. Excoriations of the os and of the canal of the cervix uteri. 4. Phthisis in its second and third stages, and cases of chronic bronchitis, accompanied with more or less purulent expectoration. In regard to the third of these groups, he observes that the strong glycerine solution is a most valuable application, and that in his hands it has been far more efficacious than nitrate of silver, or other caustic. The application of the strong glycerine solution is painless, and very effective in promoting the healing of the ulcerated surface. (*Lancet*, June 29, 1878.)

The Treatment of Pleurisy and Empyema.—Dr. D. M. Williams of Liverpool records several interesting cases of both forms of disease. In one of pleurisy he washed out the pleural cavity daily for thirty-one days with a weak solution of sulphurous acid, which the patient preferred to carbolic acid, and a good result followed. In reflecting on the mode of treatment adopted in peritonitis, synovitis, &c., Dr. Williams was led to believe that it might be possible to sufficiently limit the movements of one lung to hinder the formation of any very large quantity of fluid in the chest, and this he has attempted

to accomplish, as already recommended by Dr. Roberts, by strapping the inflamed sides with plaster, taking care to bring the end of the plaster firmly to the opposite side of the spine and sternum. The first result of this treatment he found to be great relief from pain, the next a subsidence of fever; and he gives a case and refers to several others in which this method of treatment answered well. (*Dublin Journal of Med. Science*, No. lxxvii.)

Dangers in the Use of Tinned Fruits.—Mr. Hartley, a Fellow of the Institute of Chemistry, calls attention to the fact that a considerable supply of pine-apples, peaches, apricots, and other fruits are now imported from America, and that whilst the advantages accruing from delicate fruits being obtainable at all seasons of the year at a moderate cost needs no comment, the benefit anticipated is rendered somewhat doubtful from the circumstances that the juices of the fruit are, under certain conditions, able to dissolve portions of the tin from the tin-plate in sufficient quantities to cause sickness. Mr. Hartley gives an account of several experiments he has made with a view of determining the nature and quantity of the material dissolved. In one case, in the syrup from a tin of pine-apple of about one pint in capacity, there was found a grain of tin. In a large tin of apples $\frac{4}{100}$ ths of a grain were obtained, whilst only a trace was found in a tin of lobsters. As no information of importance concerning the poisoning has been obtained, it is difficult to say what quantity of this metal may be regarded as dangerous, but he thinks it will be advisable in future to throw away the syrup contained in fruit tins. He recommends that the tin should be hermetically sealed with a drop of pure tin, as examination showed that where the solder contained lead a galvanic action had taken place. (*Lancet*, July 13.)

Dislocations of Muscles and their Treatment.—Mr. Callender remarks that but little attention has been paid to this class of injury, though they are followed by considerable inconvenience, by pain, often of long continuance, and by interference with the very amusement or occupation in the practice of which they have been sustained. Mr. Callender refers to various cases of displaced tendon, as of the biceps, the tendons about the wrist, and the peronei, in all of which, whilst the reposition of the tendon is not very difficult, the unsatisfactory feature of the treatment is the impossibility of preventing in many instances the recurrence of the displacement. He then proceeds to consider dislocations of the muscles themselves, and the following may be taken as a typical case. A man, aged forty-six, was playing at lawn-tennis, when he felt a sudden movement with intense pain in the right fore-arm. He rested the arm, had advice, but the pain persisted. When the accident

happened the fore-arm was suddenly thrown into the extreme of pronation whilst he was making a back-stroke. On examining the arm Mr. Callender found there was tenderness along the course of the pronator radii teres, and the pain in the fore-arm was severe when the hand was moved in pronation. The hand was brought into pronation, and with a pad fitted to and applied over the course of the pronator, firm pressure was made upon the muscle, whilst the hand was carried to the extreme of supination. The pressure, the patient said, gave relief, and on removing it the pain had ceased; the fore-arm could now be freely moved. The parts were rested in a sling, and he was told to keep the arm quiet. In two days' time he again tried the muscle at lawn-tennis, and again the pain recurred. The muscle was again returned to its place, and this time the arm was so fixed that the muscle was secured against further dislocation, and as no movements have since been made which would cause its displacement, the patient has remained well. As general rules for reducing dislocation of muscles, Mr. Callender recommends that an accurate diagnosis should first be made of the muscle dislocated; secondly, the muscle should be relaxed as far as possible; thirdly, by firm manipulation, such as the rubbing with the hand or by kneading with the thumb, an endeavour should be made to replace it; and lastly, pressure should be made whilst the muscle is on the stretch. (*British Medical Journal*, July 13, 1878.)

Treatment of Acne Rosacea.—Dr. Hendry, of Michigan, in reply to a correspondent of the *Lancet* asking for advice in the treatment of acne rosacea, states that good effects will often be obtained from the use of the bisulphite of soda, in doses of from fifteen to twenty grains, three times a day, or from the hyposulphite of soda, in larger doses. These may be prefaced by a few doses of calomel and jalap. When the acne begins to disappear nux vomica may be given three times a day, before food. (*Lancet*, July 13.)

Carbolic Acid, Therapeutic Value of.—Dr. A. Dunlop is of opinion that the usefulness of carbolic acid as an internal remedy is not so widely known and appreciated as it should be. He began to use it about thirteen years ago, to check the vomiting that so frequently accompanies the cough in phthisis, and subsequent experience has confirmed his estimation of its value. He is now in the habit of prescribing it in the following affections, often with marked benefit. 1. In vomiting, especially the vomiting of alcoholic gastric catarrh, or in ordinary acute, and sometimes chronic gastric, or gastro-duodenal catarrh. 2. In whooping cough, where vomiting is a prominent and distressing symptom. 3. In the vomiting with cough in phthisis.

4. In many cases of diarrhœa. 5. In dysentery and dysenteric affections, especially in that peculiar dysenteric affection of delicate young women, where shreds of lymph are passed with the fæces, and where there is often a good deal of abdominal pain and tenderness. It is also of value in the dysenteric diarrhœa of phthisis, where scanty mucous stools are passed, which is usually a troublesome complication. Dr. Dunlop generally prescribes it in one or two grain doses, with a little glycerine to aid its solution, and some tincture of cardamoms or peppermint water to cover its taste and smell. (*Lancet*, July 13, 1878.)

Carbolic Acid in Whooping Cough.—Mr. T. D. Harries states that two years ago he had a number of very obstinate cases which resisted every remedy excepting carbolic acid, under the use of which the malady rapidly subsided. The remedy should not only be administered internally but also deposited about the house as a disinfectant, in order to modify the disease in those not yet attacked. (*Idem*.)

Butyl Chloral.—Professor Oscar Liebreich in a lecture delivered on the 18th December, 1877, referring to the chemical composition of this substance, pointed out that the name, formerly applied to it—croton chloral—was incorrect and very misleading, as it has no relation to croton oil, and that it ought therefore to be discontinued. In the human subject as well as in the lower animals the first action of the drug is to produce anaesthesia, which begins in the head and gradually passes to the rest of the body, reflex irritability remaining intact in the limbs some time after it has been abolished in the head. Then follows narcosis, but it is important to observe that anaesthesia in the head and face may be complete before any trace of narcosis manifests itself. Liebreich suggests the use of butyl chloral in operations on the face, in cases where other anaesthetics are contra-indicated. The dose for this purpose is from 1 to 2 grammes (15 to 30 grains). The chief interest of the lecture lay, however, in the remarks made as to the action of butyl chloral on the heart and the manner of death in fatal cases. In the case of chloral hydrate the heart is paralysed and its action ceases before the movements of respiration come to an end, whereas the reverse holds good in the case of butyl chloral. A fatal dose of that substance attacks the respiratory centre in the medulla oblongata and paralyses it, while the heart is unaffected and continues to pulsate for some time after death. To demonstrate this fact Professor Liebreich showed two rabbits, both of which were in a state of complete narcosis, the one from the effects of chloral hydrate, the other from butyl chloral. In the case of the first animal the thorax was opened just as all respiratory movements ceased. The heart was lying motionless,

both ventricles being dilated and filled with blood. Artificial respiration had no effect in reproducing the cardiac contractions. But on the other hand, when the thoracic cavity of the rabbit poisoned with butyl chloral was opened (at exactly the same stage) the heart was found to be beating regularly and to all appearance normally. After about two minutes the beats, which during that period had become slow, ceased. Artificial respiration at once restored the pulsations and so long as the rhythmical inflation of the lungs was kept up the contractions of the heart continued, thus affording an admirable illustration of the views as to the action of the drug which had been enunciated in the course of the lecture. Professor Liebreich also indicated that this property gave the drug considerable advantage as an anæsthetic for vivisectional purposes, especially in England. The lecturer in conclusion adverted to the value of butyl chloral in cases of tic douloureux, and advised its administration dissolved in glycerine and water, rather than in alcohol, in doses of from one to two grammes. (*The Lancet*, July 20, 1878.)

A Remedy for Tapeworm.—Dr. Bröking of San Remo, calls attention to an anthelmintic in common use among the people of Northern Italy. It appears that the fresh seeds of the cucurbita maxima or pumpkin are sold in large quantities at the herb shops, both as an article of food and as a domestic remedy for tapeworm. Their purgative action is but slight and they produce neither nausea nor pain in the abdomen, but they appear to destroy the worm. If the patient has fairly good teeth, he may be directed to eat an ounce and a half of the seeds, or the same quantity may be beaten up into a paste, with sugar and water. The seeds should be taken early in the morning, the patient having fasted from food from the noon of the previous day, and should be followed by a dose of castor-oil at an interval of three or four hours. It is asserted that the head and cervical segments seldom fail to appear in the stools. It is worthy of notice that the seeds of pumpkins grown in cooler latitudes do not possess vermicide properties; some seeds obtained in Paris and Germany did not produce the desired effect. There is, however, no difficulty in obtaining them from San Remo, for Signor Vacchieri of the Farmacia Internazionale has been good enough to undertake to forward a supply *gratis* to any hospital or infirmary. The seeds have a sweet and pleasant taste, and when beaten up with a little sugar are freely taken by children. (*Medical Examiner*, June 13, 1878.)

Rational Treatment of Lead Poisoning.—In acute lead poisoning the aim of the physician is first to render the lead in the alimentary canal insoluble, in order to prevent its absorption and then to remove the (relatively) insoluble sub-

stance from the system. Both of these indications are very well met by the administration of sulphate of magnesium, which first renders the lead salt insoluble and then carries it off by the bowels. The chronic form of lead poisoning is due to the absorption of lead into the tissues and organs, and differs from acute poisoning mainly in the fact that while in the acute form of the disease the great bulk of the poison is really outside the body and producing in the various parts of the alimentary canal its own peculiar species of irritation, modified to some extent by the action of the smaller portion which is absorbed, in the chronic form nearly all the poison is inside the body and producing its own peculiar physiological effects in the deterioration of the tissues and organs. This difference in the locality of the poison ought at once to indicate rationally a different mode of treatment, and to some extent, it is generally believed that this is attempted in the usual treatment of chronic lead poisoning, viz., by the administration of iodide of potassium. Dr. George Hay, however, on rational, rather than experimental, grounds says that instead of iodides we should exhibit chlorides. In chronic lead poisoning, he says, the lead is eliminated principally by the kidneys in the form of chloride of lead, or of oxide dissolved by chlorides or other alkaline salts. That is to say, nature eliminates the lead by making it soluble in water, in the form of chloride of lead, and then removing it by the urine. Therefore when we give the patient iodide of potassium we simply render the lead less soluble than nature would make it, and instead of hastening its elimination we retain the poison in the body. Dr. Hay suggests that of all the chlorides that which seems to be most suitable to the economy is the common chloride of sodium, to be administered in doses of one drachm three times a day, more or less, but never in quantity to occasion nausea. (*Phil. Med. Times*, March 16; and *Dublin Journal of Med. Science*, May, 1878.)

Extracts from British and Foreign Journals.

Removal of Fibrous Tumours from the Uterus by Traction.—For the past three years Dr. T. Addis Emmett has reported cases of the above class to the medical societies of New York, and has published other cases, with remarks upon the operations, in some of the leading medical journals. Although it had been his custom for years to remove fibroids from the uterus after this manner, yet the *rationale* of this course of procedure seems only to have been clearly determined in his mind a little more than three years ago.

The patient having been prepared for the operation by incisions of the cervix, the administration of ergot, or other means, which should allow or force the tumour to present at the os externum, if possible,—the hæmorrhage being controlled during the time by styptic injections or the tampon,—he proceeds to draw down the lowest portion of the tumour with the double tenaculum or vulsellum forceps. Then, if possible, other forceps are applied higher up, more traction is made, and the portion cut off with a pair of blunt-pointed scissors curved on the flat side. Traction is again made on the remaining part of the tumour, and another portion cut away, which is repeated until the whole mass is removed.

The advantages claimed for this method of operating are: *First*, less danger from hæmorrhage; for, as traction is made, uterine contraction is excited, which is kept up by the constant traction, so that the tumour may be removed, piece by piece, with scarcely any flow of blood. *Second*, less danger subsequently from septicæmia; for, as the uterus keeps up a firm contraction, it assists materially in the enucleation of the tumour, forcing it to become more and more polypoidal in character, until at last there is left to divide but the small pedicle of the tumour, consisting of its capsule. There being but this very small denuded surface, the danger from septicæmia is reduced to a minimum. (*The Boston Medical and Surgical Journal*, January 10, 1878.)

Methods of Rendering the Female Urinary Bladder Accessible, and Probing the Ureter in Women.—We find a translation, by Dr. Bernays, of a clinical lecture by Professor

Simon, in which are described very carefully the proceedings for accomplishing rapid and bloodless dilatation of the female urethra and for probing the ureters. The steps for the accomplishment of the dilatation of the urethra consist of three acts: *First, the slitting of the margin of the urethral orifice* (this being the narrowest and most unyielding part of the urethra), which is done by two lateral incisions in the upper margin of one-fourth centimetre in depth, and one downward of one-half centimetre in depth. By these incisions, considerable lacerations of this outer part of the urethra are avoided, and the finger is allowed to enter deeper into the bladder.

Dilation of the urethra with plugs forms the second act. These dilators consist of seven plug-shaped specula of graduated sizes, each larger size being one millimetre greater in diameter than the one preceding it. They are made of hard rubber, and are really specula, cut off straight at the point, and fitted with convex plugs, thus forming round, smooth dilators. After the use of the largest, which is two centimetres in diameter, the finger may readily enter the bladder. The amount of dilatation in the adult which it was found could be produced without danger of incontinence following was with plugs measuring 1.9 to 2 centimetres in diameter, or 6 to 6.3 centimetres in circumference; and, in case the disease justified a more daring course, the dilatation might be increased to 6.5 or even 7 centimetres, with the danger of producing some slight incontinence for a few weeks, which would then pass away. In girls, the dilatation should not be carried to the same extent by any means. But it was found that 4.7 to 6.3 centimetres in circumference were measures inside which it was necessary for the surgeon to keep, according to the individual case.

The third act consists in passing the finger through the urethra into the bladder and examining its interior. This is very much aided by using the forefinger for the examination, at the same time passing the middle finger into the vagina and, with the other hand above the pubes, pressing the fundus of the bladder down upon the exploring finger. The patient being anaesthetized, all the above-mentioned three acts may be accomplished in a very few moments. The indications for this means of dilating the urethra are: (1.) For the diagnosis of the diseases of the mucous membrane. (2.) For the diagnosis of foreign bodies and stones, which can be found when they are very small. (3.) For the extraction of such bodies. (4.) For the purpose of applying strong caustics in cases of inveterate catarrh of the bladder. (5.) For the cure of fissures of the urethra. (6.) For the diagnosis of defects in the vesicovaginal septum when the vagina is closed. (7.) For the diagnosis of the seat and extent of growth of tumours in the vesico-

vaginal septum. (8.) For the extirpation of tumours, especially of papillomas, starting from the mucous surface of the bladder. (9.) For the discovery and subsequent extraction or excision of renal calculi from the vesical part of the ureter. (10.) For the opening of hæmatometra, when puncture is impossible or too dangerous, between the bladder and the rectum; as, for instance, when there is a congenital deficiency of a part or the whole of the vagina. (11.) For the cure of colo-vesical or entero-vesical fistula, by cauterizing the ostium vesicoli of the fistula. (*New York Medical Journal*, October, 1875.)

Muriate of Pilocarpine in the Diseases of Children.—

Prof. R. Demm, Physician at Berne has already employed this medicine in thirty-three cases. The diseases were as follows:—Desquamative nephritis with dropsy following scarlatina, eighteen, diphtheria followed by parenchymatous nephritis with extensive general dropsy, three; dropsy consequent upon disease of the heart, two; acute rheumatic polyarthritis, three; severe broncho-pneumonia, three; tussis convulsiva, two; epidemic parotitis, two: in the latter the medicine was used for its sialogogue effect. The ages varied from nine months to twelve years. The larger number were under seven, and nine were under three. A two per cent. solution was used, and the remedy given subcutaneously. The dose employed was: for infants under two years, about one-thirteenth of a grain; for those between two and six years, from about one-tenth to one-seventh of a grain; when between seven and twelve, one-seventh of a grain at the first injection and later, according to circumstances from one-fifth to one-third of a grain. As a rule but one injection was given daily. In exceptionally urgent cases, when, for instance, there was suppression of urine for twenty-four to thirty-six hours with symptoms of uræmia, two to four injections of one-sixth of a grain each were given in the twenty-four hours, with the exception of two cases the injections were uniformly well borne. In these there supervened after each injection vomiting, hiccough, faintness, repeated yawning, and general trembling of the extremities. The above disagreeable symptoms were very much diminished by preceding each injection by a small quantity of cognac. In all the other cases the pilocarpine proved itself to be a very efficient diaphoretic and sialogue. In children over four years of age the diaphoretic action predominated over the sialogue; in those between one year and two years of age the reverse was the case. The action of the medicine began to show itself from three to five minutes after it was injected; it then reached its greatest intensity within ten to fifteen minutes, remained stationary during twenty to forty minutes, exceptionally during fifty to seventy-five

minutes, and then gradually decreased, continuing, however, for several hours in a very moderate degree. In one case only did it act differently from this, the diaphoretic action ceasing abruptly after eight or ten minutes. In the great majority of times the diaphoretic action lasted longer than the sialogue. It was particularly in cases of desquamative inflammations of the kidneys with dropsy, following scarlatina, diphtheria, &c. that the value of this remedy as a diaphoretic was made manifest. In the majority of these cases diuresis was also excited; while at the same time the amount of albumen and blood was not increased, but rather diminished. There was no demonstrable influence upon the activity of the heart's action. (*Boston Med. and Surg. Journal*, January 17, 1878.)

The Treatment of Trichinosis.—Rohde had a case of trichinosis in which severe bleeding of the nose occurred, and in which he prescribed extract of secale cornutum as a styptic. The hæmorrhage was immediately arrested, and with this rapid improvement of the general symptoms also occurred. This result led him to prescribe ergot, in other cases of the disease; and in all instances distinct improvement followed. He believes therefore that we have perhaps in ergotin a means of treatment which, without having any marked effect on the human economy, may prove fatal to trichinæ and their offspring. (*Berliner klin. Wochenschrift*, No. 23, 1877.)

The Action of Parenchymatous Injections of Acetic Acid in Carcinoma.—Th. Gies effected marked improvement in a case of cancer seated on the ramus of the lower jaw, which had returned after operation, and had attained the size of a fowl's egg, by the injection of acetic acid in the proportion of one part of the acid to three of water. The tumour speedily underwent reduction of size, and was ultimately no larger than a hazel nut. The same patient had a second tumour of the size of an egg beneath the ear, which almost entirely disappeared in the course of twenty-one days after twenty-five injections of strong acetic acid. In a woman, again, who had a carcinoma of the size of a pigeon's egg, in the left mammary gland, ten injections effected its removal in great part, in the course of a month, reducing it to the size of a hazel nut. (*Deutsche Zeits. f. Chirurgie*, B. viii. p. 279.)

The Relations of Glycerine to Coccobacteria and to Septic Infection.—J. Mikulicz observes that whilst glycerine may be used in surgery as a good antiseptic in the dressing of wounds, it has the power, on the other hand, of preserving certain pathogenic substances in such a manner that even after the lapse of months they are capable of exerting

their poisonous action. He has endeavoured to explain this peculiarity by determining what percentage of glycerine is requisite to prevent the development of bacteria in fluids favourable to their growth, and under what conditions these small organisms are destroyed by it. He considers it to be perfectly established that glycerine is capable of fixing a series of albuminous substances, and their derivations, notwithstanding their unstable nature. As nutritive fluid he employed ox-blood diluted with an equal quantity of spring water, in which decomposition occurs with rapidity, the first bacteria making their appearance in the course of twelve hours. His first series of experiments showed that the addition of from two to ten parts per cent. of glycerine retarded the advent of putrefaction; two per cent. retarding it for several hours, and ten per cent. retarding it for forty-eight hours, when the fluids were placed in a hatching oven, whilst at the ordinary temperature of the air two per cent. retarded it for twenty-four hours, and ten per cent. for five days. An addition of from twelve to fifteen per cent. glycerine not only retarded the first appearance of putrefaction, but rendered all the later stages of the process more slow, putrefaction never in fact becoming fully developed. The addition of twenty per cent. of glycerine prevented the development of bacteria and completely arrested purefaction. It is interesting to notice, however, that the addition of twenty-two per cent. did not prevent the development of blue mould. A second series of researches were directed to determine under what conditions glycerine proved fatal to the vegetation of coccobacteria. He found that its action depended first upon the percentage of the glycerine, and secondly upon the temperature of the mixture. Persistent, or rather resistant, spores were met with which retained the form of germination when placed in a Pasteur's solution, long after the bacteria generally were killed. His researches on the influence of glycerine on septic injection were made exclusively by the subcutaneous method; one cubic centimetre of the infectious material was injected to each 1,000 grammes by weight of the animal's body, and careful observations were subsequently made. Such injections killed rabbits with great rapidity with acute septic symptoms. The causes of the disease were due to local foci where in part poisonous chemical combinations occurred, and in part coccobacteria developed which continue the process. The chemical poison produced by the bacteria is soluble in glycerine, and can be preserved for a long time in glycerine. Its action upon the organism can be produced either by injecting the glycerine filtrate or a mixture of glycerine with dead bacteria. It results from his experiments that by the direct and persistent contact of a fresh wound with glycerine putrefactive processes will not

take place. But if the putrid poison is once formed the glycerine will not destroy it, but dissolves it. On the whole it does not seem to be very well adapted for use in practical surgery as an antiseptic. (*Archiv. f. klin. Chirurgie*, B. xxii., Heft 2, 1878.)

Feigning Fever.—Sellerbecker reports a peculiar case of feigning in order to secure greater attention. The chief points are as follows:—A female patient under treatment for stenosis of the heart and ulcer of the stomach. Temperature found to vary without apparent cause from 101° to 103° , pulse 120, and respirations twenty. The rapidity of the pulse was easily explained, and Sellerbecker himself, by means of rapid and deep respirations, elevated his own pulse from seventy-five to 130 per minute. The elevation of temperature was more difficult of explanation, but was evidently effected by deceit. To clear up the point, the thermometer which in the axilla registered 101.1° was placed in the rectum, and then gave only a temperature of 99.6° . The patient eventually confessed, and explained her method of acting which was that as soon as the nurse had placed the thermometer in the axilla from pretext of cold she covered herself well, and then drawing the back part of her chemise forward in the axilla, and making of it a kind of sac to envelop the thermometer, she pressed it firmly between the arm and thorax, then by rapid respiration she produced friction of the thermometer between the folds of her chemise. Dr. Sellerbecker found on trial he could by this means procure a registration of 114.4° . This effect could not on account of evaporation be produced, when the thermometer was subject to friction on the skin itself. But when the skin was very dry in the course of three minutes a temperature of 107.4° was obtained. It would seem from this case, that the temperature in the axilla when the respirations are rapid, and skin dry, should always be corroborated by the temperature in the mouth or rectum. (*Berliner klin. Wochenschrift*, and *Chicago Med. Journ.* May, 1878.)

Treatment of Inverted Toe-Nail.—Dr. T. E. Satterthwaite states that so many plans have been recommended for the obstinate and annoying affection which goes by this name, that novel treatment is hardly to be expected; and yet the plan adopted at the Demilt Dispensary answers the purpose admirably in the class of patients that come for relief. Having tried the various methods recommended, including elevation of the edges, removal of the nail, &c., and found them unsatisfactory in the main, perhaps because the patients did not carry out the directions given them, he was led to pursue a plan which was suggested by a former pupil, Dr. H. E. Jones. It consisted in removing that portion of the nail, including the matrix, which

produced the soreness, and then applying the actual cautery to the base. A girl aged twenty-three had been unable for two months to put on her shoe from the pain due to an inverted toenail. A narrow slice of the offending portion of the nail was removed under ether and the base was burned, with the actual cautery. A few days after the patient returned much relieved. The ulcer was then dressed with balsam of Peru. In three months time the patient walked with perfect ease. A little soft ill-formed nail formed in the cauterized matrix, but has not grown forward or laterally, and cannot be of any inconvenience. The class who come to a dispensary are usually servant-girls, who are anxious to resume work as soon as possible, and cannot afford to give the time necessary to the other methods of curing this deformity. In some cases, where the nail is excessively thickened, it would appear to be an appropriate remedy for persons in any condition of life. (*New York Medical Journal*, April, 1878.)

Therapeutical Properties of Monninia Polystachia.—Amongst the medicinal plants recently suggested as possessing important therapeutic value is the Monninia Polystachia, one of the Polygalaceæ, which has an extensive distribution, growing near the summits of steep mountains in South America, as well as in the woody plains and marshy districts of the same region. It is a pretty plant to which, however, hitherto but little attention has been paid by chemists. Therapeutic virtues have been attributed to two parts of the plant, the bark of the root and the recent leaves. The latter are regarded as expectorant, whilst the former is considered to be astringent. The root of the plant is fusiform, sixteen or eighteen inches in length, of yellowish colour, with scattered darker spots, slightly disagreeable odour, and taste at first sweetish, but subsequently becoming acrid and bitter and exciting salivation. Its infusion is turbid like soapy water. By the Americans it is named “yallhoy,” and the bark of the root is pounded and made into a paste. No complete chemical analysis has as yet been made of this drug, but it is known that it contains a large proportion of resinous material. This appears to be divisible into three parts, one of which is soluble in ether, a second soluble in alcohol, and a third equally resinous, to which they give the name of monninia. The drug can be administered both as a powder, and in infusion. The dose is from 10 to 12 grammes per diem. The following are some of the preparations:—Tincture: bark of the root 100 grammes, alcohol 300 grammes, macerate for four days, frequently agitating and filter, then add sulphuric ether 150 grammes, macerate for 48 hours more, and mix the two liquids. Ointment: Extract of monninia 4 grammes, lard 20 grammes, essence of lavender 4 drops. Fl. Ung. (*Estudos Medicos*, Nov. 4, p. 33.

Notes and Queries.

THEVENOT'S GLOBULES.—We have received from Messrs. Edge & Co. a selection of medicines made up like capsules, about the size of a large pill. The outside coating is made of gum instead of gelatine as in ordinary capsules, and the following advantages are claimed by the inventor for these globules :

The most volatile substances can be accurately dosed and preserved for an indefinite period. The efficacy of the medicine is increased by its divisional action on the membrane of the stomach. The globule, unlike the pill, does not become stale, hard, and gritty, whereby particles are apt to adhere to the mucous membrane and fatigue and irritate the stomach. The medicament is pure and unadulterated by the foreign substances necessary in other modes of administration. The case being made of pure vegetable gum—not gelatine, as in capsules—is perfectly soluble and digestible. The medicament is conveyed without taste, flavour, or smell ; many medicines can be used in globules which their nauseous nature would make repulsive in any other form. The doses are accurate ; the medicines are the best and purest. The prices are within the reach of all.

We have tried some of these globules and find that they can be swallowed easily, and have not the slightest taste. We have also tried a specimen of mustard leaves which they have sent us, and which in size and shape resemble Rigollot's well-known leaves. This specimen we found to be a very active rubefacient. One of the neatest things we have seen for a long time is Kips' cartridge, which contains the following articles packed into an ordinary sized cartridge, and retained in place by an elastic band. 1. A compress for stanching blood, to be applied to the wound, or, in case of bleeding of the nose, to be used for plugging the nostrils. 2. A piece of plaster (Kips' Ointment), for healing inflammation, sores, boils, whitlows, burns, scalds, cuts, and corns ; warm slightly before applying. 3. A bandage for securing the compress, or the plaster ; to be used as a sling, if required. 4. A piece of tape for binding the bandage, or (in case of cut of a vein or artery) for tightly compressing the limb above (for an artery) or below (for a vein) the wound, to

prevent the outflow of blood. 5. A small bottle of ammonia, to be used with water for washing wounds or mosquito stings, or in case of venomous bites (rabid dogs or snakes) to be rubbed pure into the part—a safe antidote if used at once. 6. Waxed thread; (7) safety and surgical pins, to be preserved for the surgeon's use when he arrives.

These cartridges are the very thing for a volunteer's or tourist's knapsack, and are most convenient to have about a house, as everything likely to be wanted in case of an accident is contained in them, and thus can be found at once, while the separate things would very probably be laid aside in different places, and time would be lost on looking for them.

DOSIMETRIC MEDICINES.—We have just noticed a convenient form of giving some medicines of moderate bulk. Another kind of globule for the administration of powerful drugs has been sent to us by Messrs. Burgoyne, Burbidges, Cyriax & Farries. In this globule small doses of such powerful drugs as arseniate of strychnia are made up with milk-sugar, and look exactly like homœopathic pilules. Dr. Burggraeve, whose name these globules bear, scouts homœopathy as a hoax and believes allopathy to be a system of excessive dosing. He has therefore invented a system of his own, which he calls dosimetric, but we think that before he did this he ought to have known more about allopathic practice than he seems to do. At the same time his globules are very convenient for the administration of powerful drugs.

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Department of Public Health.

SANITARY FUNDAMENTALS.

(Two Lectures Delivered at the Royal Naval College.)

BY J. NETTEN RADCLIFFE.

LECTURE I.

THE FUNDAMENTAL PRINCIPLE OF SANITARY METHOD.

MR. PRESIDENT AND GENTLEMEN,—

It would be impossible for me to stand within this building¹ or its precincts for the purpose of speaking on the subject of hygiene, without recalling to memory certain far-distant scenes and events now long past. I have vividly before the mind's eye the several spots where lie the sailors and marines who died before Sebastopol. I can see the simple inclosure at the head of the great ravine within which rest the dead of the Naval Brigade. I can see the burial-place of the Royal Marines on the heights east of Balaclava, and near to them the vineyard where lies one of my own comrades. I can see, also, on the heights to the west the "Sailors' Burial Ground," as it was named, where lie the dead from the ships stationed in the harbour, and, as I speak, I seem

¹ The Royal Naval College is established at Greenwich in the buildings familiarly known as "Greenwich Hospital," and formerly used as an asylum for old and disabled seamen of the Royal Navy. These lectures formed part of the extra course for the present year, authorised by the Lords of the Admiralty. Certain paragraphs in the lectures might, perhaps, be recognised by some readers as having appeared in articles published in other journals several years ago, and to which the author's name was not attached. I mention the fact to prevent misapprehension. The articles in question were from my pen.

to hear a distant echo of the minute-guns from the squadron in the bay outside, which marked the passage of the body of Rear-Admiral Boxer, C.B., dead of cholera, to its last resting-place there. On that burning day of June, 1855, I lay under canvas on the opposite heights with the life, as it was believed, slowly ebbing away, and each report as it came up from the bay beneath struck upon the dulled ear as the toll of a passing-bell. At this period of the year a wealth of wild flowers springs into bright life amongst the tall grass which covers the spots I have mentioned, and each mound and the foot of each monument becomes glorious with "quaint enamell'd eyes," red, white, yellow, blue, and purple. But the memory does not alone recall the resting-places of our sailors in the Crimea. It recalls also those on the Bosphorus, and especially that one resting-place where sailors and soldiers lie intermingled, the burial-ground at Scutari. Scutari is a sacred spot to Englishmen—sacred from the stupendous misery which it once overshadowed; sacred from the quiet resting-place beneath which lie a great army of England's bravest sons; sacred from the memory of Florence Nightingale. There, standing out white and clear on the edge of the cliff, the long line of tombstones seem as if they were keeping watch and ward over the green mounds beneath them—nay, seem almost as if in death, as in life, the officers stand at the head of their men, drawn up in the silent order of the grave, while above all brood the solemn, impassive countenances of Marochetti's great granitic angels.

When last I visited this sacred spot it was in the present month of the year—the month of March. The grave-mounds were carpeted with the brilliant white rays and bright yellow discs of the ox-eyed daisy, and it was a pleasant conceit to imagine that in the expansion of these flowers might be read the

"Emblems of our own great resurrection,
Emblems of the bright and better land."

It is no idle fancy which has led me to recall these scenes. The spots I have referred to are mementoes of the part which the Royal Navy took in the siege of Sebastopol and in the Crimean war generally. Whatever may have been the political results of that war, it exercised an enduring influence upon the hygienic

progress of this country and upon the sanitary welfare of the army and navy. The part of the Royal Navy in the hygienic teachings of the war forms one of the most instructive episodes of the great struggle. The history of the episode from the point of view here suggested has not yet been written, and I may venture to express a hope that at some period it may form the subject of lectures delivered in this Hall. Unfamiliar with naval life, I may not do more than touch incidentally upon it. In the report on the health of the Black Sea and Baltic fleets in 1854-55, prepared by the late Dr. Bryson, not long ago the Director-General of the Navy Medical Department, and in the reports of Dr. William Smart (now Sir William Smart, K.C.B.), who had charge of the hospital of the Naval Brigade, on the health of that brigade during the war, and in other papers, a rich mine of information exists on the subject. The Naval Brigade did not escape unscathed from the tremendous disaster which befell the British forces encamped on the plateau before Sebastopol in the winter of 1854-55, but its sufferings were comparatively light when contrasted with those of the army of which it formed a part. And this contrast existed not alone with our own land forces during that terrible winter, but it was observed also when a comparison was made with the land forces of our allies the French. The winter was scarcely less calamitous to them than to ourselves, and the Naval Brigade, of which the encampment lay between the two armies, presented as great a contrast to the one as to the other. The evils of the winter touched it more lightly, and it was the first to cast them aside and to resume with an almost startling resiliency its vigour.

This striking contrast, pregnant with precious lessons in hygiene, was observed during the winter whenever the naval forces were brought into contact with the land forces, whether our own or our allies. Let me, however, exonerate myself from any suspicion of invidiousness. I refer to these facts because their comparative study makes luminous the conditions which determined so different an incidence of disease and mortality among the sailors and the soldiers who constituted the force before Sebastopol during the winter of 1854-55. It is no passing sentiment, therefore, nor the associations alone of this building wherein I now speak, that has caused me to recall to mind the

burial-places of our sailors in the Crimea and on the Bosphorus. To me and those who think with me, these resting-places are hallowed not only on account of the memory of the surpassing bravery of the men who lie there, but also because they are memorials of events far other than the carnage of war, in which our naval forces played an important part, and which have exercised and still exercise a profound and beneficent influence upon this country. What these events were will presently appear; and I do not know that I can better and more instructively convey the lesson which it is the particular purpose of this lecture to teach than by recalling them. The Crimean war was one of the most important agencies concerned in the development of sound sanitary method and practice in this country; and the subject of this lecture—The Fundamental Principle of Sanitary Method—constitutes probably the one permanent legacy left to the nation by that war.

The great catastrophe which befell the British army in the Crimea during the winter of 1854-55 was no novelty in our military history, but it occurred under circumstances very different from any that had ever before presented themselves in the wars waged by this country. It occurred at a time when the country had been thoroughly aroused to a sense of the supreme importance of the health of the population as affecting the welfare of the nation, and was prepared to take an intelligent interest in all questions relating to the subject. It occurred also under circumstances of publicity such as had never attached to an army in the field before. Let me recall here the leading facts of the Crimean disaster so far as they concern my present subject.

I have said that the catastrophe of the winter of 1854-55 was no novelty in our military history. It had been paralleled by other disasters to British forces arising from like causes, as at Walcheren, 1809, in China, 1841, and in Rangoon, 1852. The bitter truths taught by it were neither new nor unknown. They had been iterated and reiterated, for a century or more, in words as emphatic as the language possessed, by army medical men. The pages of Pringle, Robert Jackson, William Fergusson, Henner, and Guthrie bristle with them. But precept and example—nay, even disaster and disgrace—had alike failed to

impress Government and the military authorities with the momentous character of these truths. The public, also, in a great measure ignorant of the needless waste of life and strength of our army in peace, and regarding this waste as a necessary incident in war, looked solely to the fighting efficiency of the forces in number and armament, and found ample consolation in success for the cost in life, however terrible, at which it might have been purchased. The soldier was on all sides held to be a mere machine—a living, sentient, self-acting one truly, but still a machine. If this machine could be trained to a thorough knowledge of weapons, and to act in full co-operation with other like machines, what more was needed? Its efficiency was estimated by its destructiveness, and its destructiveness by the perfectness to which it could be drilled to combined action, and its skill in wielding the means of offence. Certainly the machine required feeding; but this was a question of quantity merely. It had to be clad; but what more could be needed than to clothe it prettily? It had to be housed; but shelter from the wind and the rain was surely sufficient. It was self-acting and apt to indulge in erratic movements, neither conducive to its own welfare nor to that of the community—well, there were the provost-marshal and the chaplain as monitors. Truly, as it would seem, a well-ordered and well-found machine! But the incidents of the sad winter of 1854-55 taught another and widely different story. Then England learnt for the first time how strangely it had misapprehended the requirements of the soldier.

By the electric telegraph, the facility of correspondence given by steam-power, and the marvellous intelligence of the daily press, the most intimate life (so to speak) of the Crimean army was laid open to the English public from the time of its leaving these shores to the time of its return. Every act, every movement, every shortcoming, every achievement, whatever most concerned the welfare of the soldier and the honour of the kingdom all was set forth, at the moment, with a completeness and power of description altogether unparalleled in contemporary records of war. The citizen at home, sitting in peace by his fireside, possessed a more accurate knowledge of the progress of events at the seat of war, in their entirety, than the man who was engaged in the struggle.

The heart swelled as the thoughts dwelt on the gallant army which left England for the East, perfect in the matured powers of the men, in their admirable training, and superb and lavish equipment. How eagerly the fancy followed the troops day by day, almost hour by hour, from point to point, of their destined course, and from camp to camp! How vividly it pictured to itself every item of the soldier's life to the remotest detail—for not an item was lacking from the wondrously graphic narrations of journalists—at Gallipoli, at Varna, and in the great beleaguering which crowned and ended the war. But the forces had barely landed on a foreign soil, when an uneasy consciousness that all was not as it should be began to possess the public mind. The soldiers did not appear to be quite at home under canvas; neither officers nor men exhibited any great aptitude for campaigning; there was a painful degree of bewilderment in the commissariat; and stores were often missing in an incomprehensible manner, or were not forthcoming when most required, or were needlessly difficult of access. Contrasted with the French forces, the campaigning qualifications of our troops at the outset presented a somewhat sorry figure. It began to be suspected that the training to which British soldiers were subjected, admirable though it might be for the parade-ground and probably for actual strife, did not initiate them into the habits fitted for active warfare and a life under canvas—did not fit them, in short, for that very phase of life which of all others is peculiar to the soldier. The suspicion grew with the progress of the war, gaining strength from the events at Varna and on the beach near Eupatoria, the night after the descent upon the Crimea. The horrible dead-lock at Scutari quickly followed, and doubt was at an end. With amazed indignation the British people saw an utter absence of organisation in the general hospitals, department clashing with department in hopeless confusion, and official routine setting at nought the dearest interests of the soldier and honour of the country. It witnessed the wounded of Alma, of Balaclava, and of Inkerman, and the rapidly increasing sick from the camp before Sebastopol, crowded together without order or decency, and wanting even the sheerest necessities amidst an apparent profusion of stores, and within cannon-shot of a great city. It witnessed these gallant men

rotting away amidst revolting filth and neglect; the vast buildings in which they were housed converted into foul pest-houses; the medical staff helpless amidst the trammels of senseless regulations; and the military authorities deaf to remonstrance, and placidly replying to all protests that they had no official information of the state of things being such as the public press represented it to be.

Then the indignation of the people broke forth. It intervened with a force which could not be said nay to between the sick and wounded and the authorities. From its abundance the nation poured out whatever was needed to give its maimed and helpless soldiers ease, comfort, and the hope of life. The *Times*, true to its great mission, organised this spontaneous outbreak of public feeling; and Florence Nightingale appeared upon the scene, and, like the glorious angel who, descending at the gates of Dis, lit up the murky air with a splendid radiance and dispelled the shadows from Dante's countenance, so she dispelled the hideous gloom which had gathered around the sick and wounded at Scutari and extended its dark shadow to every hearth in the kingdom, from the palace to the cottage.

But the worst was yet to come. The pitiless winter fell upon the Crimea. I forbear to dwell upon the horrors of that period when, to use words which at that time thrilled in every heart throughout the country—

“Praying breath rose white in air,
Eyes were set in a stern stare,
Hands were held up for help that came not as they sank in silence low;
Our grand, our gracious dead,
Who lay down in their death-bed,
With their winding-sheet and wreath of winter snow.”

Little had been rightly foreseen; little fittingly provided for by the military authorities. But for the indomitable courage of officers and men—a courage which, alas! was most conspicuously displayed in contending against needlessly-created evils—the entire extinction of the army and a disgraceful ending of the campaign could scarcely have been prevented. A mile and a half of neglected road, torn up by ammunition-waggons and heavy guns, and converted into an almost impassable slough by the first rains, reduced the troops to the verge of starvation,

while from the heights on which they kept weary watch and ward could be seen the tall masts of ships deeply laden with all things which might supply their great needs. The hurricane of November added to the difficulties occasioned by the want of foresight, and the rigours of winter found the men in summer garments, and imperfectly sheltered beneath tents which afforded little protection against cold and wet. Scanty rations were made still more scanty by the ignorance of all ranks in what manner best to cook and economise their food. Nay, the ignorance in this respect was so great that not unfrequently it happened that the men suffered all the evils of privation from their inability to turn to proper account a sufficient ration. Fuel, when scarce, was wasted egregiously by the want of knowledge how most economically to use it. The encampments became diffused cesspools, partly from the absence of all definite sanitary regulations, partly from an enforced neglect resulting from the over-taxed powers of the soldiers exhausted in the siege works. The miseries of the sick were increased by the want of every comfort, and even by a deficiency of the most necessary drugs, tons of which were lying idle and inaccessible from some fatuous official caprice, or from being buried beneath irremovable cargoes in the holds of transports. No one was responsible for a fitting adaptation of the resources at hand to the wants of the soldiers. Under the combined influence of excessive fatigue, the packing together of the men for warmth in banked-up tents or virtual dug-outs, the unutterable filth, the insufficient rations, salt meat, and an extreme scarcity of vegetables, typhus, dysentery, camp diarrhoea, scurvy, and other ailments broke out, heightening the wretchedness of the soldiers. Herds of cattle abounded on the south coasts of the Black Sea, but the commissariat pleaded insufficiency of transport. An illimitable supply of vegetables might be obtained within a three days' voyage, but it was no part of the commissariat's duty to provide vegetables, as they did not enter into the ordinary ration. The authorities at home tantalised the troops by sending out green coffee; the authorities at the seat of war did not conceive that the rectification of the mischievous error was one of their functions. While the organisation of the French army permitted the issue of soft bread to our allies

from the beginning of the campaign, the scurvy-stricken British forces were tortured with hard biscuit, which their spongy and bleeding gums would hardly permit them to gnaw. Nay, more, with an apathy almost incredible, the higher powers suffered large quantities of lime-juice, which would have mitigated the sufferings of the men, to lie for weeks unheeded in the commissariat stores.

The different departments, indeed, strove to adopt the routine of peace to the contingencies of war. It was no part of their duty to modify the standing regulations of the home-service. The welfare of the soldier sank into insignificance before the requirements of official custom. The lives of the men were weighed against vouchers and returns, and found wanting. The authorities at home worked in harmony with their subordinates abroad only so far as they blundered in harmony. Every one was in fault, and yet no one was to blame. Forty years of peace had given rise to a military system unfitted for war, and experience had once more to be gathered at the cost of a great and gallant army.

Happily for the nation the then Secretary at War, Mr. Sidney Herbert, afterwards Lord Herbert of Lea, rightly appreciated the true significance of the great disaster which darkened his period of office. Thenceforward he devoted himself, at the expense of labours which, alas! too quickly undermined his physical powers and shortened his life, to those inquiries into the sanitary condition of the soldier which ended in the regeneration of the army at home, in the colonies, and in India.

Under the immediate influence of the catastrophe which had befallen the army before Sebastopol, and of the unrestrained indignation of the people, Royal Commissioners were sent to the seat of war to investigate the state of the hospitals, the supplies, and the camps. The result of these inquiries conclusively showed that the sufferings of the troops were less dependent upon what was inevitable in a winter campaign than upon the defective organisation of the different departments of the military service, and the ignorance of both officers and men of the actual requirements of campaigning. They showed also that the sailors of the Naval Brigade (paradoxical though this may seem) had more readily adapted themselves to the exi-

gencies of a soldier's life than the soldiers, and had suffered less in consequence. The suggestions of the Commissioners, which, to a great extent, had been anticipated by the correspondents of the public press, and which were obvious from the moment of the forces landing in the Crimea, had, when carried into effect, the almost immediate result of rescuing the army from the slough of misery into which it had been plunged. The hospitals were quickly reduced to order and efficiency, and the health of the men speedily rallied. From month to month the physical vigour of the troops improved, notwithstanding the harassing duties of the siege, and the evil sanitary condition in which, at the best, they were too frequently of necessity placed; and before the end of the war the remarkable spectacle was presented of an army maintaining a higher degree of health in the field, in presence of the enemy, than when comfortably housed in barracks at home during peace.

Yet there was still another tragedy to be enacted in the Crimea before the war ceased. I have already spoken of the French army as suffering less than the British from the sicknesses incident to the campaign during the winter of 1854-55, and I have more than once referred to the better organisation of our allies, in view of field service, at the beginning of the war. There can be little doubt that to this better organisation and to the greater adaptability for campaigning displayed by the French soldier during the first period of the war, the comparative immunity of our allies from the sufferings which crippled the British forces was owing. But after the termination of the first winter, and during the time that the British army was recovering from the state into which it had been plunged and was proceeding step by step to that extraordinary pitch of health and efficiency I have described, the strange spectacle was presented of the French army gradually sinking into a state of misery and disease, which eventually, in the winter of 1855-56, equalled, and, indeed, if it were possible, surpassed, what had been witnessed in the British army the preceding winter. A more startling contrast was never contemplated than that presented by the English and French camps and the English and French hospitals during the winter of 1855-56. On the one side—the French—was to be seen a gallant army melting

rapidly away from privations and from typhus, dysentery, scurvy, camp diarrhoea, and other deadly ailments, camps degenerated to the lowest depths of negligence and filth, hospitals from which all semblance of hospital care and order had gone, and which were equally deadly to patients and attendants. As in the Crimea, so in the Bosphorus: the scenes which had been enacted in the British hospitals at Scutari in the winter of 1854-55 were now re-enacted in the French hospitals in Constantinople in the winter of 1855-56. But there the resemblance ended. With the coming of the spring of 1856 there was no arrest of the diseases which were sapping the marrow of the French army, such as there had been in the case of the British army the preceding year; and when peace was declared the entire disablement of the French forces from privations and sickness appeared to be imminent.

I have already stated that the events which I have described occurred at a time when this country was prepared to receive and apprehend their sanitary significance.

Shocked into some sense of interest in questions of public health by the epidemic cholera of 1832-33, and thoroughly aroused to the gravity of these questions by the dreadful epidemic of typhus and concurrent epidemic of scurvy which accompanied the Irish famine of 1847, and was followed by the great epidemic of cholera of 1848-9, England, when war was declared against Russia in 1854, was earnestly engaged at home in carrying out her first systematic attempt to organise an efficient sanitary administration throughout the country, her efforts being stimulated by the third epidemic of cholera then in progress. This work was proceeding with much friction when the events of the Crimean war presented, perhaps, the most complete and striking illustration of the effect of sanitary measures in preventing disease, and of the fundamental principles of sanitary method, since the virtual abolition of scurvy and extinction of "ship-fever" in the Royal Navy, under the successful measures inaugurated and largely carried into effect by Sir Gilbert Blane. The illustration had not the less powerful influence upon this country because it was given in the first instance fragmentarily, and, so to speak, undesignedly, in the letters of the various news' correspondents;

and it could not have been more complete had it been a thoroughly devised experiment. What the people of this country witnessed was this: they saw the army of the East leave these shores a gallant body of picked men, including among their ranks the pith of our manhood from the noble to the peasant, exultant in their strength and vigour and glittering in their warlike guise. They saw this gorgeous organisation from the moment it placed foot on the shore of the Crimea sink slowly, surely, helplessly into a state of which their experience could only find a parallel in the lowest depths of the most degenerated population of our great towns. They saw developed in hideous detail on the heights of Balaclava and the plateau before Sebastopol the conditions which were characteristic of much of our town populations, and which the Legislature was then endeavouring to ameliorate. The encampments in the Crimea in the winter of 1854-55 were a ghastly similitude to many familiar spots in London, in Liverpool, in Leeds, in Glasgow, and other great British towns; and though the sentiment of war might veneer, it could not conceal the ugly truth. There was the like privation, with the like results; the like unutterable filth, again with the like results; the like close packing together of the living, still with the like results; the like squalidity of person, clothing, and surrounding, again and again with the like results. Setting aside the daily record of killed and wounded, there was scarcely a distinction to be made on Christmas Day, 1854, between the gallant force which had left these shores flushed with pride in the previous spring and the inhabitants of the foulest back slums in London or in Liverpool. In both privation sapped the physical strength and brought scurvy in its train; in both the filth and close-packing co-existed with typhus and other deadly ailments; in both squalor brought forth the revolting plague of vermin. If the mind reverted to the state of these back slums in 1847, when they were filled with the fugitives from the great famine in Ireland, the incidents of which were then quite fresh in the mind, the parallelism between them and the camps before Sebastopol became even more marked. The history of the renovation of the English army after the winter of 1854-55 became then a lesson as momentous in civil as in military

hygiene—a lesson not the less incisive because the Commissioners chiefly concerned in giving force to its teachings, viz., Mr. Robert Rawlinson, C.E., C.B., Dr. Hector Gavin, Dr. John Sutherland, and Dr. Gavin Milroy, were taking a foremost part in that work of sanitary organisation in progress in this country to which I have referred. Under the measures suggested in the main by these gentlemen, and the establishment of sufficient commissariat regulations, diseases under which the army was melting away vanished as if by magic. With the introduction of proper food scurvy presently ceased, and with the cleansing and better ordering of the camps and hospitals typhus, dysentery, and diarrhœa practically vanished: by the adoption, in fact, of the same sort of sanitary measures which it was sought to make common in our towns and villages at home, diseases which were at that time and still, although happily to a less extent, are the curse of our crowded communities, disappeared from the army, and the men reached the remarkable pitch of health which I have already described. And this result, it must be remembered, was brought about with the troops occupying the same positions which they had occupied since the beginning of the siege, positions around which of necessity had been deposited the accumulated filth of the occupation and all the dead, human and brute, for which a resting-place had to be found in the progress of the siege.

If it had been possible for any doubt to have rested upon this great result and its causes, the spectacle of the French army sinking into the slough out of which we had escaped, and the conditions under which this happened, would have put an end to it.

Here, then, was a lesson in hygiene, having the precision and force of a scientific experiment, as applicable to civil as to military life, and which exercised a less obvious but hardly less important part on the progress of civil hygiene in this country than it did upon military hygiene.

As I have been speaking it will scarcely have escaped your attention that the war which has just ended has furnished another illustration of the great hygienic truths I have been describing, for we have witnessed the Turkish armies in Bulgaria and Armenia sink into a slough of misery, privation, and squalor

similar to that in which our army was in the Crimea ; and, let me add, the Turkish forces which were with it then were overwhelmed in the winter of 1854-55, and became in like manner a prey to scurvy, dysentery, diarrhœa, and typhus. We have witnessed also the Russian armies scourged, although less severely, with the same evils. And at this moment we are seeing in progress one of the most disastrous after-consequences of war ; a wretched repetition of what came after the war of twenty years ago. It is not very widely known that when Sebastopol fell, the liberated garrison which had suffered from typhus towards the close of the siege probably to as great an extent as the French army, on its withdrawal and distribution in the interior of the Empire, carried the fatal disease with it, and communicated it to the civil population at each halting-place. In this manner typhus was scattered widely in the interior of the country, and caused a loss of life which has been estimated at considerably over 100,000. A similar process of infection of Russia with typhus from the seats of war in Bulgaria and Armenia has now been for several weeks going on, and the dissemination is being effected on a scale which far exceeds that which happened after the Crimean War. The great development of railway communication in the Russian Empire of late years admitted of remarkable organisation being effected at the commencement of the war for the relief of the sick and wounded of the Russian army. But from the scarcity of medical men in the Empire, as it seems to me, this very organisation, which redounds to the highest credit of the Imperial Government and of the people, has been helping in the spread of disease through the Empire. Under a combined military and Red-Cross administration the sick and wounded in Bulgaria and at the seat of war in Asia were rapidly drafted off to the principal towns in the interior of the Empire, where hospital accommodation was provided for them, and in this manner the hospitals attached to the armies in the field were relieved from the immediate pressure which the severe fighting and prevalence of sickness would have thrown upon them. Unfortunately, as it has proved, the precautions to prevent the dissemination of infection have not been so successful as the arrangements for distributing the sick and wounded, and typhus

has been introduced from the seat of war into almost all the towns where ambulances have been established. This mischief has been aggravated to an almost uncontrollable extent by the hosts of Turkish prisoners that it has been necessary to send into the interior, each host being infected with the disease. Typhus in this way has been spread broadcast from the shore of the Black Sea to the Volga, and over much of Caucasia, and the civil population is now reaping a bitter reward for the noble efforts it has made for the relief of the sick and wounded. In like manner typhus is being now scattered throughout the civil populations at the seats of war in Armenia and Bulgaria, and the principal harvest of death there has probably still to be reaped.

Important as was the lesson taught to this country by the events of the winter of 1854-55 regarding the mode of production of certain familiar but formidable diseases which lay like an incubus upon the energy and productiveness of the people, disabling and pauperising where they did not kill; and regarding the efficacy of sanitary measures for their removal, there was a second lesson of even greater importance learned from those events. This lesson related to the fundamental principle of sanitary method, and on this account, as touching the very core of sanitary science and practice, it stands pre-eminent among the hygienic lessons of the Crimean war. That lesson was this :—

The disasters which befell our army in the Crimea in the winter of 1854-55, and the French army in the succeeding winter, were the natural outcome of the divorce which existed between military administration and military medical knowledge and experience: in other words, these disasters were the direct result of the want of due co-ordination between medical and military science in the conduct of the campaign.

I have already stated that the disaster of the winter of 1854-55 was not a novelty in the military experience of this country. Like disasters had occurred with such sufficiency of frequency in our wars that, except among military medical men, it appeared to have become regarded as an ordinary contingency of war. When in April, 1854,¹ the Director-General of the Army

¹ 28th April, 1854, Dr. Smith to Military Secretary; 2nd May, 1854, Military Secretary to Dr. Smith.

Medical Department (Dr. Andrew Smith) submitted to the Commander-in-Chief at home his views of certain measures which should be taken to maintain the health of the army in prospect of an autumn and winter campaign, and received for answer that his suggestions, even if correct, involved too much disturbance of the existing state of military organisation to admit of consideration, the army was foredoomed. And when, in the autumn of 1854,¹ the Principal Medical Officer of the Army before Sebastopol (Dr. J. Hall, afterwards Sir J. Hall, K.C.B.), reporting to the Commander-in-Chief in the field the urgent necessity of certain provisions being made for the sanitary welfare of the troops in the rapidly coming winter, was curtly told that in making this report he had travelled out of his province, the fate of the army was irredeemably sealed. And so also of the French army. That serious mischief did not come so early with our allies was due to their army remembering some lessons of previous campaigns; but that it did come after all and come so severely was due to the same blunder as with the English the failure to use medical knowledge in the current day-by-day business of the army.

On the other hand, in the Royal Navy at that time, an administrative *consensus* had been arrived at which admitted of the knowledge of the medical officers being freely applied to the sanitary as well as the medical and surgical requirements of the sailors. Hence primarily the striking differences observed in the sanitary state of the Naval Brigade as compared with the army before Sebastopol in the winter of 1854-55, and the not less striking difference observed between the management of the naval hospital and the military hospitals on the Bosphorus. The fundamental medical nature of the questions arising out of the catastrophe was confessed when Dr. John Sutherland and Dr. Hector Gavin, and, on the latter gentleman's death, Dr. Gavin Milroy, were sent out to the East to suggest means for the removal of the evils which the medical officers of the army had foreseen, and had willed to prevent, yet had not been permitted to prevent.

But the lesson in this sense went deeper still. It helped, indeed, in the solution of the fundamental problem of sanitary

¹ See Dr. Hall's letter to Dr. Smith, 12th February, 1855.

science. If the lesson had stayed in its effects at the point to which I have now brought it, it would have failed of the enduring influence it has exercised upon the progress of hygiene in this country. It would have taught in the most startling and indisputable manner the *general* efficacy of sanitary measures, but it would have contributed little to the solution of doubts which at that time were seriously hampering both the unlearned and the learned in the particular application of these measures. The lesson, however, went further. Up to this time, under the teachings of the great pioneers of public hygiene, and the broad principles of sanitary procedure laid down by them, large sums of money had been expended in many parts of this country on local sanitary improvements, and 'professingly these improvements had taken account of medical experience, and again professingly that experience was to be held in view in further work. But the profession was true in only a limited sense. In the official relations of hygiene to medicine at this time there had grown up a system peculiar to official life, and having no sort of relation to the current work. This system, a marvellous product of the officialism of the period, undertook to set at rest for all time, irrespective of a progressively increasing medical knowledge and of actual observation, points which the College of Physicians and the great schools of medicine hesitated to express a decided opinion upon—the doubts arising from the complexity and exceeding difficulty of the questions being dealt with as if they were mere perversities of the medical mind. The result was that hygiene was drifting away from scientific medicine in civil life, as it had drifted away in military life before the beginning of the war. The official system ran a danger of breaking down as ignominiously and hopelessly as the medico-sanitary arrangements of the army at the beginning of the war had broken down, and the great work done in the first instance by its promoters in arousing attention to public health questions and formulating the main principles of legislative and municipal action with regard to them, bid fair to be largely neutralised, and public health administration received a wrong bias which still exercises an evil influence over sanitary work in this country.

Two honoured names in naval medicine have an important place in the history of this period, the names of Dr. Bryson and

of Dr. McWilliam, C.B.,—the latter famed for the part he took in the ill-fated Niger expedition of 1841. Both these gentlemen did much to counteract the crude and mischievous official doctrines which had been sought to be placed in vogue as to the modes of diffusion of cholera and yellow fever. But this period is especially memorable in the sanitary history of this country as that in which the great master of modern hygiene, John Simon, came upon the scene, and for the beginning of his beneficent efforts to effect a reconciliation between the scientific medical requirements of hygiene and the various administrative agencies by which these requirements must be given effect to in civil life. The period was memorable also for furnishing perhaps the most striking illustration that could be cited of the necessity for such reconciliation; for a problem of medicine was then in progress of solution which was destined to revolutionise one of the most important questions of public health then engaging the attention of the country, to remove some of the gravest doubts which hindered sanitary progress, and to show in the most unmistakable manner the true method of sanitary research and procedure. The events of the Crimean war helped in a marked way to the solution of this problem.

At the time of which I am speaking, the various forms of "continued fever," so termed in contradistinction to "intermittent fever" (ague), and "remittent fever"—were regarded as varieties of one and the same disease; and some distinguished teachers deprecated a growing tendency in the medical schools to consider certain of these forms as independent diseases. This deprecation referred partly to a disposition among medical men to multiply names for incidental varieties of "fever," partly to certain teachings, first of the French, and subsequently of the Scotch schools of medicine, that under the term "continued fever" were grouped together several essentially distinct diseases. These teachings culminated in this country in certain researches of Sir William Jenner, which proved that under the common term "continued fever," as used here, were included at least two specifically different diseases "*typhus*" and "*typhoid* (enteric)." He showed that each of these diseases had a different history, pursued a different course, presented different appearances in life and after death, existed under different conditions, and spread

among populations in a different manner. This determination threw a flood of light upon the diverse and at times apparently contradictory results which had followed the adoption of sanitary measures in various places, to the apparent discredit of these measures and of their promoters. The etiological relations of typhus were shown to be with domiciliary over-crowding and with destitution ; the etiological relations of " typhoid " with filth. Obviously, these facts being ascertained, the conditions for abatement of one sort of disease must differ essentially from those for the abatement of the other. Often the two sets of conditions existed together in the same locality, as also the two diseases ; but until the discrimination of the two diseases had been effected, general measures directed to the abatement of " fever " had necessarily proved hap-hazard, and the cause of this irregularity in the influence of these measures had accordingly remained inexplicable.

But other far-reaching consequences followed from this discrimination.

While there was a general concurrence of opinion among medical men that certain forms of continued fever, particularly the *typhous* forms, were communicable from the sick to the well, no such concurrence existed as to the *typhoid* forms, as they were then generically termed. At this period the question of the communicability of disease was considered solely with regard to such phenomena of communication as were observed in small-pox, scarlet-fever, or measles, in which the recipient of the infective material must be brought into more or less immediate communication with the patient or his personal surroundings, in order that he shall suffer from it. But the discrimination of typhoid from typhus, while showing that this position held good with reference to typhus, brought to light the important fact that typhoid fever spread from the sick to the healthy in a very different fashion—a fashion of its own—and thus paved the way to a conclusion which has exercised the greatest influence over subsequent etiological research, namely, that there were ways of communicability of a disease previously unsuspected, and that diseases might be communicable in ways peculiar to themselves, quite distinct from and altogether unlike the ways of communication belonging to the more commonly known communicable

affections. The spreading of typhus, or of small-pox, of scarlet fever, of measles, was connected with exposure to the emanations given off in the breath or from the body of the sick; but the spreading of typhoid had definite relation with the distribution of the excremental discharges of the sick as they were deposited in privies, cast upon the ground, passed into drains and sewers, gained access to wells, &c., and so in numerous unsuspected ways, a knowledge of which is as yet unexhausted, exercised a baneful effect upon healthy persons having no immediate communication with the sick. Hence it began presently to be understood that sanitary measures, as regards typhoid, could be alone successful in proportion as they stopped the various routes by which the excremental discharges of the sick could reach, in certain hurtful fashions, the healthy. In other words that such measures could alone be successful when guided by the results of medical research in the particular disease.

What is true of typhus and typhoid is true of all diseases which have been shown to be influenced by sanitary measures; and the supreme merit of the discrimination of typhoid from typhus in relation to hygiene, was the clear and decisive proof then furnished that *a true sanitary method must rest upon the discrimination of diseases*,—or in other words that *the fundamental principle of true sanitary method was the discrimination of disease*.

The recognition of this principle has governed all the sound work in hygiene since the period of which I have been speaking, as I shall have occasion to show in my next lecture. Indeed, true hygiene is only possible in proportion as clear and accurate knowledge of disease is obtained. Hygiene, the preservation of health, is in reality the art of preventing disease. In the earlier days of this art it was believed that health could be maintained and diseases avoided in the gross. Experience has taught us otherwise, and that like all arts resting upon a scientific basis, hygiene to be practised successfully must be founded on a scientific method. And such method consists in dealing with the particular conditions which favour the assaults of particular diseases in detail. How far it has been possible to carry out this method and to formulate from it principles for ordinary

guidance in the common condition of the life of communities. I shall endeavour also to indicate in my next lecture.

Now the events of the Crimean war, as I have stated, influenced in a marked manner the clear apprehension of the fundamental principle of hygiene. France had escaped from that sad familiarity with typhus which we possessed in this country, and even her most advanced medical teachers, although the first to broach the question, had, on account of their inexperience of typhus, very imperfectly recognised the arguments advanced by Sir Wm. Jenner and others in this country, as to the essential distinction of typhus and typhoid. To very many of the medical men serving with the army of our allies in the East, typhus was a new disease. The opportunity was, however, given them there to study the malady on a vast scale, side by side with typhoid. The result of this study was to confirm the conclusion of Jenner, then accepted by the medical schools of this country; and the disaster of our allies in the winter of 1855-56 came thus to support the scientific discovery which has probably exercised the greatest influence on sanitary method and practice in these later days.

Gentlemen, I will ask you to suspend your judgment on the course I have taken in submitting this medical aspect of hygiene to you until the close of my next lecture, when I shall hope to convince you that it has not been entered upon without deliberation or without serious purpose.

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THE CLIMATIC TREATMENT OF PULMONARY AND OTHER DISEASES, WITH SPECIAL REFERENCE TO SOUTH AFRICA AND SEA TRAVEL.¹

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SOME two years ago several articles were contributed by Dr. C. B. Faber (then Resident Medical Officer at the German Hospital) to the *Practitioner* on the Influence of Sea Voyages in the Treatment of Consumption. There is no doubt that the climatic, as distinguished from the therapeutic, treatment of chronic pulmonary diseases has, until quite recently, received far too little attention at the hands of physicians as well as general practitioners. No classification of climates was attempted, and it has been hitherto thought sufficient to induce the patient to get away from the United Kingdom during the winter, or if that be impracticable, to send him to some place in Devonshire, Cornwall, or elsewhere in the south, trusting meanwhile to therapeutics and diet. During the past twenty years, as means of locomotion have multiplied, Italy and the south of France have been utilised, as well as to some extent Madeira, Egypt, and latterly Australia; and, more recently still, New Zealand, certain parts of South America surrounding the

¹ A portion of the matter contained in this paper appeared in the *Lancet*, May, 1878.

Andes, Algeria, and the Cape have been included in the list. But the majority of the last-named places are, even in these days of cheap and rapid travelling, too far to be within the range of any but wealthy people, or those to whom time is no object. And so up to the present date no book, lay or professional, exists to which we can turn, containing a systematic or reliable account of such places.

In coming to any satisfactory conclusion in the choice of a climatic prescription it is of course necessary to have meteorological and geographical particulars, some knowledge of the geology, as well as of the fauna and flora, and a tolerably exact statement as to the modes of travelling in vogue; the sort of house accommodation afforded to residents and strangers, what they eat, what they drink, and in what fashion they are clothed. All this may at the first blush appear trivial enough and easily obtainable; but where the necessity for such information comes to us, we speedily find that it is not so, and that even when maps, gazetteers, and other standards, literary and scientific, are consulted, the fragmentary knowledge so obtained is not sufficient for our purpose. A book of the kind indicated will naturally, in process of time, be forthcoming, for the climatic treatment of disease ought now to be taught in the schools, and a text-book will be required. But such a book must of necessity be the work of many contributors. Life is far too brief to enable one author to travel far enough, and to remain long enough, to glean the requisite particulars; and in spite of all that may be said to the contrary, personal examination by a skilled observer is, in collecting materials of this sort, specially requisite.

In arranging the geographical details of such a book, it would, I think, be convenient to divide it into three parts; the first, comprising places in the United Kingdom; the second, those on the continent of Europe; and the third, all places more widely scattered, and most of which involve an ocean journey of greater or less length. The last mode of travelling forms a special item of treatment, and its desirability or otherwise should be carefully considered, as all persons, sick or sound, are considerably influenced, for good or ill, by a sea voyage. The practical conclusions arrived at in Dr. Faber's

interesting papers above referred to are—(1) That if the patient evinces any antipathy at all to the sea, or from former experiences is persistently, or for some little time, nauseated, the climatic prescription should not include an ocean voyage; (2) That if such a voyage be considered desirable, the kind of vessel (steam or sailing), the quality of food and drink provided, the situation of the cabin, the vital surroundings, and above all, the sort of weather and temperature expected, are all small but very important points on which the patient has a right to ask, and the physician should be prepared to give, accurate and specific details of advice. So that at the outset much information is required, more practical perhaps than scientific, but the want of which may overthrow, and has undoubtedly often overthrown, our calculations as to the result, and spoilt success. For all those who have travelled much, if at all, by sea, will tell you that as a rule persons either positively abhor a ship and its surroundings, or take to it very kindly, whether ill or well at the commencement of the voyage, with remarkably good results; and hence marine experiences, so to speak, must be acquired, to enable the physician to elect as to whether the patient shall take the sea voyage as a sort of preliminary prescription, or not. Again, far too little care as well as judgment is used in the selection of the ship, directions as to clothing, and the season for starting—all very important items that may make or mar the success of the journey, and influence the life as well as the welfare of the patient. And the unwisdom of sending cases of advanced pulmonary disease a long distance from home, without any calculation as to the probable effect of the voyage, or any knowledge of the comforts to be found in the new country, is still too often practically exemplified. The result in brief of such mistakes is that the subject of them comes home to die, or dies upon the passage; one indirect but undoubtedly disastrous effect being that the climate of the place to which the patient was sent is blamed, without any sort of reason. It is as though you purged a man suffering from peritonitis, and when he died blamed the so-called remedy instead of the prescriber. The vast influence of clean air, in, so to speak, washing out the lungs, preventing putridity in the discharges that flow from

their wounds, and so giving those wounds a chance of granulating healthily, and of scarring well, can be hardly appreciated by those who have not, in some of these pure atmospheres, watched the progress towards recovery. But the kind of air prescribed, and the state of the patient when he takes the prescription, are points to be considered more carefully and more categorically than the ultimate composition of the most elegant (or most nauseous) mixture ever planned by the physician, or concocted by the chemist.

It occurred to me that the following notes might do duty as a chapter to the sort of book indicated in the above remarks:—

Many circumstances have recently drawn public attention in a special way to our possessions in South Africa. Mr. Froude's semi-political excursions thither, the annexation of the Transvaal, and the still unsolved Zulu "difficulty," the Kafir war, the action of Sir Bartle Frere as to the Colonial ministry, and his Excellency's efforts, for the sanitary regeneration of Cape Town, have all made us interested in this quarter of the southern hemisphere. Mr. Donald Currie, by an active and wholesome rivalry, has diminished the length of the passage for, and increased the quality of comforts to, those who travel to the Cape. Mr. Anthony Trollope, in a sketchy, and Mr. John Noble, in a matter-of-fact way, have given us an opportunity of learning many important particulars of a country very little known and, undoubtedly, in some respects, too little appreciated.

About six months ago, being compelled to avoid an English winter, I proceeded to the Cape, and determining (from former somewhat superficial experiences of South Africa) to give the country as radical a trial as could be made within the time, "trekked" up-country, and passed through Cape Colony, the Orange Free State, Griqualand West, the Transvaal, and Natal, stopping at places indicated by London physicians as peculiarly salubrious. This journey occupied nearly three months, a stay at Wynberg (about eight miles from Capetown) with excursions to Ceres, Wellington, Stellenbosch, &c., altogether six weeks, and the ocean journeys six weeks. Every information was afforded by residents at all the districts visited, and no pains were spared to make my stay at each and every place as pleasant, as

beneficial, and as instructive as possible. Hence I believe that a brief record of the practical experiences gleaned on this journey will be useful to the profession as well as to those of the public who must perforce be classed as pulmonary cripples. The report may be conveniently divided into two parts—(1) Experiences, (2) Recommendations.

The ocean journey to Cape Town, starting from London, Southampton, Dartmouth, or Plymouth, now occupies on an average from twenty-one to twenty-three days, and may be considered a fine-weather passage at almost all times of the year. It is hardly necessary to mention that the quick transit from cold or wet to the heat of the tropics is more or less trying to all invalids, and, in the majority of cases, usually results in loss of appetite, hectic, and sometimes hæmorrhage, with a slight exacerbation of the symptoms that have been prominent during the progress of the case. But the Donald Currie and Union steamships are excellently well fitted and found, and those who secure a deck cabin secure also quarters very well and amply ventilated. The patient arrives at the capital of Cape Colony, and on landing enters unfortunately the most insanitary city in South Africa. Cape Town is described in the March number of the *Cape Monthly Magazine* as “underdrained, surface-drained, and in some places not drained at all; the underground drains are continually blocked, because there is not water enough to flush them properly, and the surface drains are as constantly choked, and so speedily become a nuisance both to eye and nose.” All the hotels are of a very mediocre, and some of a most inferior, description. There are, of course, plenty of lodgings, but for the above reasons it is patent that Cape Town is, even for the healthy, by no means a salubrious dwelling-place, not mentioning the dust and winds with which it is infested at certain times of the year. What, however, in the majority of cases, does the patient do? He has received no specific instructions from home to avoid this city, and so establishes himself here for days, weeks, or months, finding out, only after a long term of residence, that there are two charming suburbs of the city, east and west, where the entire climate and all its surroundings are the very antitheses of those that obtain in the place itself. There is the sea suburb

(Green and Sea Points), and the western district behind the mountain, where the scenery around Wynberg and Constantia may fairly be classed as the garden of South Africa. The air here during the summer is delightful. There are all varieties of hill, scrub, and woodland, and rides may be taken for miles through avenues of oaks and acres of vineyards, or along the seashore to Kalk Bay and Simons Town. But the district possesses only two or three hotels, and some few boarding-houses, inadequate both in number and character to the wants of invalids, *who have been properly and systematically directed, in their search for health*. It happens, however, with perhaps the majority of invalids, that though not warned against Cape Town, they have been advised to go "up-country." Natal is recommended in some cases, the Knysna in others, and so on. But it appears that Cradock and Bloemfontein are most generally prescribed, the former being 550 and the latter 680 miles from Cape Town. There are at least six ways in which land journeys may be accomplished in this country:—(1) By post-cart (the most costly and the most uncomfortable), travelling night and day in a vehicle that in some parts of the country is not inaptly compared to a wine-case on wheels. (2) By coach holding from eight to ten people, drawn by four, six, or eight horses, and a marvel of strength as to springs and axles, in spite of the mishaps that occur frequently. You are compelled to spend from eight to thirteen hours a day in this vehicle, or stop a week at some fearful roadside inn for the next; so that if the entire journey lasts, say five days, and the coach is full, much discomfort, not to say misery (to a sick person), must result. (3) By spring waggon with mules or horses, all of which, as well as outfit, must be bought, and boys hired to look after them. (4) By ox waggon, with from twelve to sixteen animals. The former of these last-named conveyances will allow the accomplishment of about thirty miles a day, if the animals are well attended to; and the latter about fifteen miles daily. In both these cases provisions are taken, and you camp out—"outspan," as it is called—independent of hotels (there are no "inns" in South Africa). (5) By private Cape cart, with four horses, accomplishing about thirty miles a day. (6) By transport waggon; buying a waggon and oxen, and loading it with mer-

chandise on your own account, or hiring half a waggon for your own accommodation; progression in this case will not average much more than twelve miles a day. These particulars are stated *seriatim*, in order to show that much consideration should be given to the mode of travelling. All varieties except by ox waggon are expensive, but categorical particulars on this head will be given presently.

The roads, however, form a much greater element of discomfort than the vehicles. Froude, Trollope, and other writers on South Africa have said something about them; but, even after experiences of Indian, American, Turkish, and fen roads, it is difficult to convey any idea of the exquisitely uncomfortable and painful sensations endured by travellers in Cape Colony, and indeed all the other districts in a greater or less degree. Robust men grumble, and with good cause; but these remarks are of course supposed to be made from an invalid's point of view. The accommodation on the roads is, in many cases, as bad as the roads themselves, and in some particulars excessively objectionable to any middle-class traveller, whether sick or sound. Ill-cooked food, two and three-bedded rooms, very costly and very bad drinks, and filthy sanitary arrangements are in the Orange Free State, the Transvaal, and many parts of Cape Colony, the rule rather than the exception. At places specially recommended as health resorts, the same grave defects exist. There is usually but one hotel at all habitable, and absolutely no lodgings. This hotel has, generally, most of its bedrooms arranged round the stable-yard, in close proximity to the horses, the manure heap, the invariably stinking latrines, the kitchen, and the chattering native servants. As all rooms are double or treble-bedded, you are liable at any time to have one or more companions who may or may not be eligible. The *table d'hôte* system prevails universally, and though the servants are, as a rule, civil enough, there is no sort of machinery for increasing the comfort of an invalid, or one with a capricious appetite. There are, as a rule, no private rooms. Continual bar-drinking is one of the curses of the country everywhere, and it may be readily imagined that, under circumstances of idleness, the proximity of this practice is undesirable. Minute carnivora, of one or other description, abound in the bedrooms, and during

the hot weather, flies in all varieties, and (in Natal) mosquitoes combine to worry.

We may now glance at the sort of "up-country" that appertains to South Africa, our possessions there, be it remembered, occupying about as much superficial area as the Continent of Europe, so that great varieties of scenery and temperature exist. The quickest way to reach the upland country from Cape Town is by steamer to Port Elizabeth, a very busy, but by no means salubrious place. The passage from Cape Town occupies about forty hours. Uitenhage is a pretty and well-watered village, about an hour out by railway, and, having seen it, the traveller proceeds by railway to Alicedale, eventually reaching Graham's Town, over three hours of one of the most execrable roads in the colony. (I believe however that the railway is now open beyond Alicedale.) Graham's Town is 1760 feet above the sea-level, and forms a pleasant resting-place, where lodgings can be obtained, but where double-bedded rooms prevail, even at the best hotel. It is, however, desirable to stay here for some few days at least, and it is said that really comfortable quarters can now be secured. The journey northwards to Cradock occupies about twenty-one hours by post-cart, and passes through Bedford, a charming little place, inclosed towards the north and east. The road between Bedford and Cradock runs in many places along the banks of the Great Fish River, and is inexpressibly bad. Cradock, 3,000 feet above the sea-level, is very much extolled as a health resort, and the air is certainly very pure and clear, though the summers are mostly hot. There is a fair supply of water, and many trees about the town, which contains some capital gardens. But there is no adequate accommodation for invalids, and you run a risk at the hotel, among other things, of being stowed away in a sort of triple bedroom, each room communicating with the others, and each accommodating two or three persons. I am compelled to speak thus emphatically of this objectionable arrangement because adequate ventilation under such circumstances is, of course, quite impracticable. Most of the country around is unspeakably monotonous, and the dreariness increases as you proceed northwards through Middleburg and Colesberg to the banks of the Orange River, which separates Cape Colony from the Free

State. You travel over miles of undulating plain, almost entirely devoid of trees or shrubs, varieties of birds and buck being seen at intervals. There is some excitement to a novice in crossing streams at the drifts, for considerable care is required to prevent accidents, and delays in the rainy season are inevitable and frequent. The roads in the Free State, after crossing the Orange River, are decidedly better; but the country between Bethulie and Bloemfontein, through Philippolis, Fauresmith, Reddersburgh, and Bethany is, if possible, still more dreary than the colony. It is, however, quite possible to sleep in a waggon or in the open air with impunity, if you have made arrangements to do so, and this is undoubtedly the most pleasant mode of travelling. But in a long journey water is often a difficulty. It is frequently very scarce indeed; the streams at which you halt are sometimes intensely muddy, so that you cannot bathe in them or drink from them satisfactorily, and thus one of the necessary adjuncts to camping out is often out of your reach.

Bloemfontein, according to some authorities the Eldorado of health resorts, is a neat-looking quiet town of some 3,000 inhabitants, 4,750 feet above the level of the sea, built in the centre of a plain bounded miles away by mountains, and almost entirely surrounded by the Modder river. There is a bishop and a cathedral staff; and the former, as well as the members of the latter, spare no pains nor courtesy in trying to promote the comfort of visitors, invalid or otherwise. These, with President Brand and the chief inhabitants, including the clergy of several other denominations, all combine to form a pleasant though very small clique of society, so that Bloemfontein is considered by many the most Anglicised town in South Africa. The Kafirs have their own location, and are kept in very good order. But here, again, the same conspicuous want of accommodation exists, and the same dreary prospect surrounds you. There are two hotels, framed according to the model described above; and no lodgings, houses being extremely scarce and rents very high. The country and the summer temperature are not favourable for walking, and if you ride or drive out there is nothing to see, and, even in the matter of sport, comparatively little to do. An excursion to the large native village of Thaba 'Nchu and to some farms in the neighbourhood afford some little variety. But

beyond these there are absolutely no extraneous resources of any kind, and men of business have already, good-naturedly enough, taken into their employ more than a sufficiency of "pulmonary" clerks and assistants. This condition of things is somewhat disappointing, after a rough, expensive, and wearisome land journey of more than 600 miles not reckoning the sea-passage. But the air is undeniably splendid in quality, the water-supply is good, and, as Bishop Webb is building an establishment to be classed as a convalescent home for invalids, the want of some quiet anchorage will possibly soon cease to be felt. There are doubtless many cases of arrested phthisis now living in the town, and two or three special "cures" are invariably quoted by the inhabitants whenever the health question crops up. The coach to and from the Diamond Fields now goes through Bloemfontein once a week *viâ* Queenstown, Dordrecht, Aliwal North, and Smithfield. The entire journey to Bloemfontein from Cape Town by this route occupies about ten days. Mr. Trollope and others say that the accommodation is fairly good along the road by this route—that is, I suppose, for a healthy person. It should be mentioned that there are two or three farmhouses near Bloemfontein, where, possibly, quarters may be obtained, and where milk, eggs, fruit and vegetables are very abundant. I spent in this way a comfortable week, being most kindly entertained by Mr. John Beck at Fountain Valley, a large farm with an orchard big enough to feed well nigh all the residents in the capital of the Free State, if properly worked.

The "grandeur of monotony" (quoting the remark of a Bloemfontein Church dignitary), may again be contemplated as you journey towards Kimberley. At this curious town, the site of the New Rush diggings and the capital of the Diamond Fields, fairly good accommodation can be obtained, with ice, and other minor luxuries. But potable water is scarce, and often very bad, the heat is great, nearly all the houses are built of corrugated iron, and the dust is sometimes intense. But in spite of these disadvantages, I have no manner of doubt that the place, as a health resort, is equal to Bloemfontein, or any other town in the Free State, one of the indirect causes being doubtless that living generally is more comfortable, and that there is a great deal to see, and, for those who choose to work,

plenty to do. I could fill many pages with a general description of this interesting place, but the Editor would I suspect decline to receive it.

Crossing the Vaal River, and so entering our recently acquired possession, the Transvaal, you find a fertile country, with plenty of orchards and scrub, many trees in some places, a lovely climate, and intensely bad travelling and accommodation. The *ne plus ultra* of nastiness as to food, &c., is reached at the roadside inns in this district, and minute vermin here have it all their own way. At the houses of the Dutch Boers you are entertained with rough-and-ready courtesy, plenty of milk and eggs being always obtainable. Good water is abundant almost everywhere, and if a patient could take his home comforts with him to the Transvaal, and get there without being shaken to pieces, he need want no more salubrious location.

Our most eastern South African province is very fitly called "Fair Natal." Although the higher districts are, in some parts, bleak and barren, much of the country is well wooded and watered, possessing delightful mountain scenery. Colenso, Estcourt, and Ladysmith are all pleasant little villages, recommendable enough if the patient goes out with the idea of permanent residence. Indeed, all the roadside resting-places are immeasurably better than any in Cape Colony, the Free State, Griqualand West, or the Transvaal, resulting from the fact that Natal is far more thoroughly anglicised than any of the other provinces. But, except in the upland districts, the summer temperature is very high, and the air is less dry than that of the other provinces. Pietermaritzburg, the capital, is a comparatively comfortable place of residence, where good and quiet accommodation with pleasant society can be obtained. The same may be said of Durban, the seaport of Natal, which, though possessing lovely surroundings, where all kinds of so called hot-house fruits grow in the open air luxuriantly, is yet objectionable for invalids, except during two or three months in the winter, on account of its moist heat.

It will be observed, by looking at the map, that a large district, comprising extensive tracts of country between Natal and Cape Colony, called Kaffraria, has not been commented upon at all, because the unsettled state of the country at the time of my

visit placed it quite beyond the range of invalids. The west country comprising Malmesbury, Clanwilliam, and Namagualand, is said to be healthy, but is inhabited sparsely. The Great Karroo, through which passes the high road from Cape Town to the Diamond Fields, has a dry air, but almost no water. Whereas the southern districts, including the Knysna (sometimes strangely recommended to invalids), and the districts of Riversdale, George, &c., are either too low or too much wooded to be specially healthy, though they are all fairly accessible.

The foregoing remarks are intended to point chiefly to the fact that too much haste is often exhibited in sending pulmonary patients to South Africa, because very little, indeed appears to be known as to the special peculiarities of travelling, accommodation, and other circumstances that go to influence the health of persons accustomed to English manners, customs, and comforts, quite as much as clean air. Of the clearness, dryness, and general salubrity of the air there can be no doubt, but, as things are now, special care is required in choosing cases, prescribing the season, and describing pretty accurately the several modes of travelling.

It should be, but it certainly is not, superfluous to record most emphatically that South Africa is no place at present for pulmonary invalids in an advanced stage of disease. I have seen invalids wandering miserably about Cape Town, or have met them coming and going on board ship, whose condition indicated that no possible good could come of such a journey, because they were physically incapable of getting "up country," and so into the high and dry air that alone would give a chance of prolonged life. To send such cases out is little short of cruelty. No one should be advised to go even to Wynberg, or other places within easy reach of Cape Town, who is not well enough to be up and in the open air for a great part of the day, and to take horse or carriage exercise. Patients may be conveniently divided into two classes: (1) Those who go out merely to avoid the English winter, one, two, or three successive years; (2) those whose symptoms are graver, or to whom time and money are of comparatively little object, and who go out to spend eighteen months or more in the country. In either case October is about the best month to start, particularly just now, when our

English springs come tardily, and autumn weather sometimes almost reaches November. It is very important to secure a deckcabin, for, though there are no better organised steamships afloat than many of those on the Cape mail lines, the ventilation of first-class vessels, as of West-end houses and public buildings, is still frequently defective, and the heat of the tropics is often trying in many ways. It is better to embark at the final port of departure—*i.e.*, at Dartmouth or Plymouth,—as the uncertain proclivities of the Channel are avoided, and the ship is in better order than when hauling out of dock. [I have not touched upon the question of taking passage in a sailing vessel, because very few well-found ships of this class trade to the Cape.] The passage, occupying from twenty-one to twenty-three days, sometimes (I may say often) effects a favourable change, evinced by increased appetite, diminution of cough, and good nights. On arrival at Cape Town it is best to go out by railway at once to Wynberg and secure quarters, so as to avoid any actual residence in the capital. Of the four hotels, Rathfelder's has by far the best situation, and some very pleasant private sitting-rooms. (The administration, however, is very defective, but the present lease will shortly be at an end, and if some such enterprising hotel managers as Messrs. Spiers and Pond could secure the establishment, the result would undoubtedly be a financial success, because English physicians could then confidently recommend their clients to one of the most charming and healthy spots at the Cape.) Whether a single English winter or a much longer period is to be spent at the Cape, it is well to make Wynberg, or (if the sea be preferred) Sea Point, a resting-place for, at all events, some weeks. Living here will cost from 8s. to 11s. a day (without drinks), and the tariff for horses, carriages, &c., is much as in England. First, as to those who come out in October, intending to return home in April or May—who come out, in fact, as a matter of caution, or to assist convalescence—to such, advice should be given, *not to rush "up country."* Young, impulsive, and energetic convalescents are almost as difficult to treat as advanced cases. I met a man of this sort, who with part of one lung still 'blocked,' had planned a long journey up through Natal to the Transvaal for hunting purposes, had gone so far as to buy waggons, oxen, &c.,

and was with difficulty persuaded to go as far as Graham's Town, and remain there quietly, "to see how things got on." I met another, travelling with his medical adviser, who, strangely enough, was specially recommended by a very eminent London physician to go to the Knysna, chiefly celebrated as the district in which the Duke of Edinburgh, some years ago, shot an elephant or two, but in no way, as South Africa goes, climatically recommendable; and to the Knysna, I believe, he went. A third invalid (a clergyman) is in my recollection as having been ordered to Pietermaritzburg, the capital of Natal, a very injudicious and tedious journey for a weak patient. These cases are tolerably typical as to what occurs to the majority of persons sent out to the Cape, advice being given, both in England and in Cape Town itself, without a sufficient knowledge of "up-country" peculiarities. For all these persons, and many more that could be quoted, would have done far better in the vicinity of Cape Town, at all events for at least six weeks or two months after arrival.

If, then, only about three or four months can be spent in the country, Wynberg (or, according to the season, Sea Point) and its neighbourhood should be made head-quarters. A very pleasant, and probably beneficial, change may be made by travelling up to Ceres, a pretty village about seven hours from Cape Town. Most of the journey can be made by rail, and the rest by cart through Mitchell's Pass, one of the most picturesque places in the colony. Or the traveller can stop at Wellington station, spend a day there, see the orange orchards of Mr. Retief drive through Bain's Kloof (another splendid pass), and so reach Ceres across country. Here, again, the accommodation is defective and limited, but Dr. Zahn, the medical practitioner of the district, tells me that he is willing to receive two or three inmates, and I am informed that the erection of a small but comfortable hotel is contemplated by an energetic resident. If variety be a necessity, a Cape cart may be hired for, say, a fortnight, and excursions made from Ceres to Southey's Pass, Montagu Pass, &c. But all these journeyings involve fatigue, indicate expense, and had best be limited in extent and frequency, unless the patient finds that he has improved, and is quite up to the work in the way of appetite, and general energy.

Another but much longer excursion may, during the stay, be made to Graham's Town *viâ* Port Elizabeth, as before described. Graham's Town is tolerably high, pleasantly situated, and very much anglicised as compared with other places. Several weeks here may be spent profitably, if the journey can be borne well. But, beyond these trips, no more extensive up-country journeying should be attempted under the conditions stated.

If, however, the patient is able to spend from twelve months to two years in the country, and has a good independent income, he may go farther, if only it be done cautiously and deliberately. Referring to the six modes of travelling detailed elsewhere, the post-cart must of course be discarded, as dangerous, most fatiguing, and in all respects objectionable, except on the score of speed. The post-cart is worse than it looks, and writing in no effeminate strain, I can record emphatically that to attempt to perform long journeys in this style, is, except in robust health, almost suicidal. The coach is, as a rule, very uncomfortable, and the long journeys very wearisome; so that, as time is no special object, it is well to break an ordinary six days' journey once, if not twice; finding out, if possible, the least objectionable halting-places. Coach-travelling too is costly, averaging, with hotel expenses, about £2 or £2 10s. per day. A spring waggon, with horses or mules, is the most comfortable mode of travelling. Nothing as a rule can be hired, and everything must be bought. Six animals at least are required, and two servants to look after them, as well as a third to superintend cooking, &c., as you are (or should be) independent of hotels. But no person should adopt this style of travelling who has not at command at least £1,500 a year. Horses sicken and die; forage is sometimes scarce; the men are careless, intemperate or incompetent; and various other difficulties beset you unless accompanied by an experienced colonist. The spring waggon with oxen is certainly the best and by far the most comfortable mode of travelling in South Africa, where speed is of no consequence. The waggon can be bought and fitted for about £130, and the oxen (ten or twelve) for about £8 each. You fit and provision according to fancy, "trek" quietly up country, averaging about fifteen miles a day. A very intelligent native of Colesberg, with whom I travelled in this way for some hours

on Christmas Day (with wife, two children, and two Kafir nursemaids), calculated that the entire daily cost was about 12s. 6d., including all expenses. (I think this is too small an estimate for there were eight mouths to feed, and ten oxen.) The oxen usually feed themselves, though it is well to give them forage, *i.e.* corn occasionally, and the Kafirs live chiefly on mealies (Indian corn). The private Cape cart is but the same arrangement as the spring waggon with horses, but on a smaller scale. There is ample room for two people, besides the driver, and for comparatively short distances it is a pleasant mode of travelling. I was told, however, by a well-known writer and traveller that, having accomplished some 700 miles in this fashion, and sold his equipage, he calculated that he and his friend between them had spent about 5s. a mile each, without reckoning the cost of their own living during the time. (But this again is the experience of a man who knew nothing about the country, and to whom money was not, I expect, a very primary consideration.) If a traveller is sufficiently well to rough it, has gained a good and healthy appetite on the way out, or by a preliminary stay at Wynberg, and is, moreover, a sportsman, the transport waggon mode of travelling will offer many attractions. It is very cheap, but a horse should be taken, as little detours may then be made with the gun, and sometimes very good sport obtained. The food is rough, and the companionship not always intellectual, but you will certainly learn more from a transport rider about the country, and how to get your living in it pleasantly, than from any other class of resident, and they are sometimes very amusing companions.

It may be remarked that all the varieties of travelling recommended involve continuous residence almost in the open air, and this is emphatically an essential part of the climatic prescription. But, if the right time of year be chosen for travelling, the air is so clear and bracing that this mode of life may be adopted as a matter of course, practised with impunity, and, with very great benefit. The condition of the atmosphere is such that you unconsciously forget to think of draughts, colds, and other minor ills from which we are seldom free in moist and low-lying countries.

(To be Continued.)

SALICYLIC ACID AS AN ANTISEPTIC AND AN ANTIPYRETIC.

BY ENGLDUE PRIDEAUX, M.R.C.S.

IN salicylic acid we have probably one of the most valuable drugs that has been brought into use during the last few years. Allied to carbolic and cressylic acid in its nature, it far surpasses them not only in its general utility as regards disease but also in the particular qualities which distinguish those acids, at the present time when the existence of germs is more generally recognised and their share in the causation of disease more fully believed in—a drug possessing the properties and power of salicylic acid should be more highly appreciated, especially when by means of it a truly antiseptic system of treatment may be thoroughly carried out. Up to the present time the antiseptic system of treatment as applied to the zymotic diseases has failed, more or less, for the reasons that either the drugs used have upon absorption into the system been so changed that their properties have altogether departed, or they have exercised such a poisonous influence upon the system that their administration has either been impossible, or being attended with danger and disagreeable results, it has been in such small quantities as to be practically of little value in the treatment of the disease.

With salicylic acid, however, the case is different, its administration when pure in large doses is unattended with danger, for in one or two cases where unlooked-for complications have occurred after its administration, it is more than doubtful that they had anything to do with the exhibition of the drug, both from their nature and from the fact of these complications being unique in its administration. I have fed a Guineapig with biscuit containing salicylic acid so that it consumed 20 grains daily for some days without any apparent detriment to it, and have

administered to it doses of 10 grains at a time with the same result, except to give it a laryngeal catarrh and hoarseness of voice, which I more than suspect was due to some of the acid "getting down the wrong way." I have administered to patients $\frac{1}{2}$ oz. in the course of twelve hours without any ill result.

That salicylic acid is a germicide has been proved by eminent observers, whose results I have confirmed by a series of experiments on various liquids. I find that urine containing $\frac{1}{2}$ grain of salicylic acid to 1,000 grains of urine, of the specific gravity 1,025, and at a temperature of 60° F. remains free from smell and cloudiness for fourteen days. Bacteria in small numbers are developed after three days, but their activity is not great. With one grain of the acid a similar result occurs, the number of bacteria is less, they are more slowly developed and mostly confined to the upper stratum of the liquid, whilst with $1\frac{1}{2}$ grains to 1,000 of urine, the urine remains clear, free from smell and bacteria for an indefinite time. A slight growth of fungous spores usually takes place on the surface after some days, if freely exposed to the air, and frequently in certain specimens of urine a crystalline sediment of salicylicuric acid forms about the sides of the glass. This is frequently to be observed in the urine of patients taking the acid. In urine to which salicylate of soda is added the same antiseptic effects are produced, but the quantity of the salt requires to be proportionately larger, about $\frac{1}{3}$ more to produce an equal effect with the acid, but the growth of the fungi is much freer in these cases. Ordinary urine becomes turbid, has a putrid smell, and contains crowds of active bacteria in three days. These effects produced experimentally are to be observed with regard to the urine of patients taking the drug. It never decomposes and seems to keep pure for an indefinite time.

A much larger proportion of the acid is required to sterilize a liquid already containing bacteria. If one grain of salicylic acid be added to 1,000 grains of putrid urine after twenty-four hours a large number of the bacteria are dead, and the motion of the rest is sensibly diminished when compared with those in a portion of the original fluid. To kill all the bacteria in a putrid solution of urine requires from 3 to 4 grains per 1,000 of urine. The result of these experiments would seem to show either that

the suppositious germs from which these bacteria spring are more easily affected by the acid than the bacteria themselves, or that the smaller quantity required to prevent their development is not sufficient to destroy them when developed. It was noticed that although in urine containing as little as $\frac{1}{2}$ grain of the acid per 1,000, no smell was developed after twenty days exposure, whereas when 4 grains of the acid was added to 1,000 grains of putrid urine, although after thirty-six hours all the bacteria were dead, the smell was hardly affected.

A solution of albumen requires one grain of salicylic acid per 1,000 to prevent the development of bacteria for twelve days, while it requires 2 grains to absolutely sterilize it.

Milk requires more salicylic acid than either albumen or urine. As much as 3 grains per 1,000 of milk being required to absolutely sterilize it, although the acid delays the curdling it does not prevent it. The curdling that ensues appears to be due to the action of the acid itself, and not to the decomposition of the milk from the formation of bacteria.

In all the experiments upon milk, fungi were freely produced upon the surface, and it is evident that a much larger proportion of the acid must be used to prevent this growth.

When salicylate of soda is added to blood it prevents it from coagulating, at the same time keeping it pure and undecomposed when added in weak solutions to small quantities of blood. Under the microscope it appears to exert no influence upon the red-blood corpuscles—after some hours they appear unchanged. I am unable to state with absolute certainty that it exerts an influence in lessening the power of motion of the white-blood corpuscles, but as the result of a few experiments with a view to ascertain that fact it does appear to do so.

The result then of the action of the drug and its salts upon the fluids outside of the body being these—viz., that it is a powerful antiseptic (that is it prevents the growth and further development of septic organisms, and also is very fatal to all the lower forms of animal life), and it possesses this property in the highest degree,—then should we not expect a somewhat similar action when administered as a drug, provided it be not so changed in the body as to affect its properties.

When pure salicylic acid is administered, part of it passes

down the intestinal canal unchanged and may be detected in the fœces, whilst the rest is absorbed into the blood: apparently in the form of the neutral salts of soda and potash, it is then eliminated by the kidneys and appears in the urine in the form of salicylicuric acid. I have, when taken in solution as one of its salts on a nearly empty stomach, detected it in the urine in ten minutes, and in the blood in less than that time.

Now it appeared to me that if the theory of the zymotic diseases being due to the presence and multiplication of germs, or morbidic ferments or organisms of any kind was true, then in salicylic acid we had a drug (which being equally powerful in its action after absorption into the body) with which we could cope with these diseases at their first onset, reducing at least their severity if not cutting them short altogether, and with this view I treated at Derby in 1876 all the cases of small-pox which came into the hospital. The results were very satisfactory as far as they went, (see *Lancet* July 28th, 1877), there being no deaths out of eighty-eight confluent cases, and the subsequent pitting was absent, but the number of cases was too small for any decided result. Since then I have treated in a similar manner twenty-eight cases of scarlet-fever, some of which were very severe, with only one death and that was a case where I was called at the height of the disease. I have treated a large number of cases of measles and a few cases of typhoid-fever with the same drug without any deaths. The primary effect of its administration is almost invariably without exception to reduce the temperature rapidly, and with a considerable fall if the doses be large and sustained to very often below the normal standard, and this is observable not only in the zymotic fevers but in all cases of disease with high temperature, including pneumonia, phthisis and acute rheumatism. In small-pox, I have notes of cases where a fall from 106° to 101° has taken place after the hourly administration of large doses for a few hours. In typhoid fever from 105° to 96° in twelve hours. In scarlet-fever from 103° to 98° , and in acute rheumatism numerous cases where the temperature has fallen from 104° to 98.4° in twenty-four hours, and from 104° to 100° in six hours, and under the administration of the drug the temperature keeps down, so that even if the drug does not exert a germicidal action it keeps the

temperature down, preventing the excessive tissue waste and loss of power attending pyrexia, thereby enabling the organs to eliminate the poison.

How is this antipyretic action of salicylic acid to be explained? In a work entitled *Disease Germs*, and in the *Lumleian Lectures* for 1875, Dr. Lionel Beale states as a result of microscopical investigation, that the blood in conditions of inflammation contains quantities of minute particles of protoplasm or hioplasm possessing motion, and the power of self increase in prodigious numbers, and he attributes the condition of pyrexia to the consequence of the increase of the hioplasm or living matter, whether it be simple or contagious and morbid, and also as the results of his researches upon the cattle plague published in the Reports to the Privy Council, he clearly demonstrates an enormous increase of germinal particles in the blood and tissues in the contagious disease. Taking these facts into consideration, is it not probable that the action of salicylic acid in destroying the lower forms of animal life may be, and is of use in restraining the activity and increase of the bioplasmic particles which appear to be the accompaniment if not the cause of pyrexia, as well as in destroying their morbid and contagious influence; that is to say, as it destroys low animal organisms out of the body, may it not do the same in the body, for we must regard these shapeless masses of protoplasm as analogous to the lower forms of animal life.

It need not be argued that if salicylic acid will destroy morbid products in the blood that it must so alter its essential elements as to injuriously affect the constitution; that it does not do so we know from experience, and it must be remembered morbid products are as a rule more prone to change, more easily affected, and have a lower vitality than the natural structures, a drug may easily be conceived to destroy the one without affecting the other.

As regards the specific contagious disorders, the antiseptic system of treatment, founded on the theory of their germ origin, was advocated by Dr. Sansom, who used sulpho-carbolic acid and its salts with very good results a few years ago; but salicylic acid is so superior to these not only in its greater activity, but in the ease and safety with which it can be administered in sufficient doses, that it affords a means by which a much more

thorough trial can be made of the antiseptic system of treatment as applied to the contagious diseases.

The results of the treatment of acute rheumatism by salicylic acid are now almost fully determined, and from the great amount of recorded and accumulated experience of its action, its beneficial effect may be considered as proved. From an experience of about forty cases I find that it cuts short the disease, so that it now lasts as many days as it did weeks formerly; it quickly reduces the temperature and keeps it down whilst the poison is eliminated from the system, if it does not have a specific action upon the disease itself,¹ and by thus lessening the duration and intensity of the disease it lessens the probabilities of complications, more to be feared than the disease itself; and this it does in a way which cannot be hoped for by the use of any other remedy. It is true that a few failures have occurred in its use in the treatment of this disease, but in the larger number of these failure has evidently been due to timidity in dosing and in administering it frequently enough, for the drug is so rapidly eliminated from the system that unless its effects are kept up by hourly or very frequent doses for some time it is not of much avail.

I have spoken of the safety with which it can be administered. Certain inconveniences have occurred in its use (more frequent formerly than of late) alarming in their nature and severity, these I believe to have been due to the method of exhibiting it and to the impurity of the drugs—these symptoms are sudden and rapid collapse, and cerebral symptoms varying from effects similar to those of cinchonism to almost acute delirium. The condition of collapse I have found to supervene after the exhibition of large and continued doses. This I have believed to be due to the rapid fall of temperature, and have found it to be obviated by giving salicylate of ammonia. I prefer to produce a combination of salicylate of soda and ammonia as in the following prescription:—

Sodæ Bicarb. gr. v.
Ammon. Carb. gr. v.
Acid Salicylic gr. xx.
Aq. ad. ℥i.

¹ See *Lancet*, November 3, 1877.

I have very seldom found sickness produced by the above mixture, although it is a common accompaniment of the use of the powdered acid in frequent doses, I may mention that the use of the powdered acid in small doses is very beneficial in the case of children with diarrhoea and offensive motions. From the passage of the antiseptic down the intestinal canal decomposition is arrested, and after a few doses the offensive character of the motions cease, and with it the diarrhoea.

The cerebral symptoms sometimes quoted as preventing the use of the drug, when severe, I believe are always due to its impurity, and with pure recrystallized acid, given in the largest doses, I have never known any symptoms which have given cause for anxiety.

In conclusion I have only wished to call the attention of the profession more strongly to the subject touched upon in the foregoing; for it is only by the accumulated experience of a number of practitioners that the real value of remedies can be certainly tested, and only by a comprehensive and thorough trial of a drug that its theoretical value can be practically determined.

THE TREATMENT OF EARLY PHTHISIS.

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THE opportunities which are afforded by the out-patient department of a large hospital devoted to diseases of the chest teach some valuable lessons as to the treatment of many thoracic affections. The great prevalence of phthisis attracts attention to it very specially. The number of bright, intelligent workers, both men and girls, that pass before one's notice in a twelve-month, and the number who succumb in that time and are seen no more, give phthisis a grim interest for the physician as well as for the patient.

Before proceeding to discuss the treatment it may be well to define, as exactly as our present knowledge will permit, the malady under discussion. Its leading characteristics are as follows. There is a pneumonic consolidation of one or both apices, extending usually to the third rib; but it may extend further, even to the fifth, or it may be localised strictly to the apical tip of the lung. The extent of lung involved is not always the measure of the gravity of the case. That is, while a great extent of lung being involved, or both being implicated, is of bad prognostic omen; the fact that the tip only of one lung is the seat of disease often carries with it no comfort; indeed the worst symptoms are compatible with only a suspicion of localised mischief, and sometimes scarcely even that. The pretubercular stage of phthisis of Laycock, *i.e.* the establishment of marked symptoms before any disease in the lung can be detected, seems borne out by increasing experience; usually, however, before the end of the case, local indications

manifest themselves, and the disease spreads rapidly throughout the lungs. Whether there is mere chronic pneumonia of the apex, with fairly good pathological products thrown out; or the neoplasm is of such a degraded character that it becomes tuberculous, to use the language of Niemeyer; or it undergoes necrobiotic changes rapidly, and breaks down into *débris*, leaving a ragged, ulcerated cavity, matters little to the treatment; though it profoundly modifies the prospect to life. In all cases what we have to attempt is to so improve the general nutrition, that the pneumonic process shall run a favourable course towards recovery; or in the other cases, to surround the dead and dying tissue with a wall (the pyogenic membrane) of fairly healthy connective tissue, which will limit the ravages of the lowly tissue-growth of defective vitality, and permit of potential recovery with a cavity or cavities. Such is what we must essay, with what success we may. It is obvious, that if any of the neoplastic growth undergoes molecular decay, either by cheesy degeneration or by the formation of an abscess, the effete material must be got rid of by expectoration; and during the softening of the mass, as well as during the time the material is being expectorated, there is hectic fever, and the patient swims for his or her life when recovery is attainable. The treatment of this period entails much attention to the individual peculiarities of each case; but as to the general principles on which cases of pulmonary phthisis are to be conducted, it is possible to formulate some rules. It is commonly held that the treatment consists of good food, containing a fair amount of fat, the administration of tonics, hæmatics, cod-liver oil—the most easily assimilable form of fat; and such palliative measures as the exigencies of the case may require. Quite so. But how to get the system to achieve all this is a matter not always easily settled: to secure this requires attention to some points which may now be considered.

The leading characteristics of early phthisis are cough, emaciation, loss of flesh, night-sweats, and pyrexia, with more or less hæmoptysis; each symptom indicating an appropriate line of treatment. For here it is essential to treat symptoms while doing our best to influence favourably the pathological process on which they causally depend. If asked the question, "What do

you think the most important matter to attend to in the treatment of early phthisis?" my answer would be "To arrest the night-sweats." "The next most important?" "To keep the stomach and intestines in good order and attend to the assimilative processes." If these are not attended to all treatment is futile, or nearly so. If the sweats are not checked the blood-salts drain out as fast as supplied; if the digestive powers are not cared for, the food taken is not assimilated, and so the patient is no nearer more perfect nutrition and effective tissue repair.

To arrest night-sweats we must have recourse to some anhidrotic, as oxide of zinc, sulphate of copper, or one of the solanaceæ, as hyoscyamus, and still more, belladonna. The first two act as astringents, generally affecting any part where there is an abnormally excessive flux; how, we do not know. Belladonna acts directly upon the secreting nerves of the sudoriparous glands, whether applied locally, or administered by the mouth. Probably hyoscyamus acts in an allied manner. Taken altogether there is no anhidrotic to be compared with belladonna: though in the few cases where it fails the other agents may be tried. But in order to get out the good effects of belladonna, it is necessary to give it in sufficient dose. The ordinary dose of sulphate of atropia—for it is much better to use a solution of atropia of known strength than to give the tincture of belladonna, which may, and probably usually does, vary in strength—is in many cases quite insufficient. The variations of toleration of belladonna in individuals is as pronounced as is the case with Epsom salts; what is sufficient of the latter for one, exercises no influence over another person, while the dose some require to produce even a gentle action of the bowels would produce well-marked, nay, serious diarrhoea in others. I use atropia in doses varying from the seventy-fifth (75th) to the fiftieth (50th), and up to the twenty-fifth (25th) of a grain. A considerable proportion of patients are unaffected until the last dose is reached; and even then do not complain of much dryness of throat, or indistinctness of vision (effect upon the pupil as a guide to the administration of belladonna is utterly worthless). With many patients the seventy-fifth of a grain of atropia will arrest the night-sweats, and in a certain number

will affect the throat and eyesight; while others require the fiftieth to influence the night-sweats: and again a small proportion are uninfluenced till the twenty-fifth is reached. Thus we see the toleration of belladonna varies very much with different individuals. An impression exists in my mind that these large doses of belladonna are more frequently required in the case of Jews than of other patients. The practitioner then must not go away with the impression that belladonna had failed in any case until he has pushed the dose to decided dryness of the throat and distinct impairment of vision; flinging aside any effect upon the pupil as a fallacious test not to be trusted; for in my experience the pupil is rarely much affected; and yet in other cases a marked effect is occasionally produced on the pupil by placing a small belladonna plaster over the heart. To some other effects of belladonna reference will be made shortly.

The profuse night-sweats of phthisis, and at times of other maladies, are very exhausting. Sweat is a secretion which contains chlorides, phosphates, and sulphates of the alkalies, as well as urea, uric acid, traces of iron, and of fat or of fatty acid. Consequently, when the sweat is profuse in a person who is debilitated, it drains the body of its salts, and in doing so cripples the assimilative powers. Usually the first consequence of arresting the night-sweats of the phthisical is the return of the appetite—food is both relished and digested. So long as this drain goes on it is practically useless to give milk, phosphites, meat-juice, &c. &c.—it is like pouring them through a sieve. The importance of checking the night-sweats cannot be over-rated.

A few words as to the associations of night-sweats may not be out of place or without instructive value. It is well known that ordinarily the night-sweat comes on towards morning—in the deep morning sleep. Often, if the patient keeps awake the sweats do not come on. On the other hand, where deep sleep is produced by an opiate given to relieve the cough, profuse night-sweats are commonly the consequence. These associations of night-sweats are significant. They largely depend upon the relations which exist betwixt the pulmonary and the cutaneous respiration;—relations much more pronounced in human beings than is commonly supposed. Their relations

in some of the lower animals are well known. When the respiratory centre is depressed in deep sleep, and the pulmonary respiration is lowered very distinctly, the sudoriparous glands are thrown into action. When the blood is deficiently aerated, and there is an excess of carbonic acid in it, the sensory nerves of the sudoriparous glands are thrown into action and sweating follows. (Ott and Field, *Journal of Physiology*, 1878). When then the respiratory centre is exhausted by the efforts required to aerate the blood, where the amount of useful lung is limited, and the respiration drops low in deep sleep, sweating, or cutaneous respiration, is the result. Belladonna is a direct stimulant to the respiratory centre when failing, either from disease or from a toxic agent, and so is useful in two ways. It arrests the action of the sudoriparous glands on the one hand: and by stimulating the respiratory centre on the other does away with the necessity for hidrosis. Consequently it is well to give atropia with morphia whenever it becomes necessary to give the latter drug to relieve the night cough of phthisis. The antagonistic actions of morphia and belladonna are now sufficiently accurately ascertained to enable us to combine them in an intelligent and practically useful manner. Belladonna does not act so powerfully upon the hemispheres as to interfere much with the action of morphia upon them; while its sedative, or paralyzant action upon the ends of the vagi (the sensory nerves) in the lungs renders it a useful adjunct to the morphia in arresting cough—a reflex action exerted by the presence of an irritant in the lungs in the form of the neoplastic growth. Not only that, but morphia lowers the activity of the respiratory centres, indeed kills by arresting the respiration, and after it the circulation: while belladonna is a direct stimulant to both. Consequently, even if there be no night-sweats, when it becomes necessary to exhibit opium or morphia for the night-cough of the phthisical it is well to combine with it a dose of atropine, to antagonise the effects upon these rhythmically discharging centres of the respiration and circulation—effects which are unsought and undesirable, yet unavoidable. (For the evidence for these statements the writer must refer the reader to his *Essay on the Antagonism of Therapeutic Agents: and what it Teaches*, 1878.) If there are already night-sweats the atropia will

prevent the opiate making them worse ; and often will be found effectual in checking them while not interfering with the desired effects of the opiate. The pill in common use by the writer at Victoria Park Hospital consists of one-fourth of a grain of morphia (hydrochlorate), a fortieth of a grain of atropia, with a grain of capsicum in powder, and three grains of Pil Aloe et Myrrh. At the West London Hospital, of one-third of a grain of morphia with one-thirtieth of a grain of sulphate of atropia. This pill is well borne in almost all cases. The morphia checks the cough and procures sleep, while the aloetic vehicle prevents the bowels being locked up, and the appetite diminished by the action of the opium upon the local ganglia of the intestinal tube, and on the sensory nerves of the stomach. By such a combination indeed we can secure the desired action of the opiate, and get rid of the effects which are objectionable and detrimental to the patient. So far I have never once seen any of the toxic effects of atropia, as dryness of throat and indistinctness of vision, follow the use of this combination ; the morphia apparently combating such manifestations. This use of opium and belladonna together will be found most serviceable in practice.

If belladonna pushed freely does not arrest the night-sweats—an occurrence very rarely encountered—then oxide of zinc with hyoseyamus, or sulphate of copper with opium, may be tried. Dover's powder, conium, quinine, the mineral acids, or tannin, or gallic acid, or ergot may be tried. Then comes the question of applications to the skin. Vinegar or a weak solution of a mineral acid may be washed over the surface with advantage. Dr. Lewis Sayre informs me that an irregular practitioner in New York many years ago gained a great reputation in the treatment of phthisis by sponging the patient with hot vinegar containing a considerable quantity of powdered capsicum. He was very effective in arresting the night-perspirations ; and, as usual, when these exhausting sweats are checked the appetite returns and food is relished and digested. However attained—if attainable at all—the first thing to be done is to check the night-sweats ; and the hot vinegar with cayenne pepper is useful in very obstinate cases.

(To be continued.)

NEUROSAL AFFECTIONS OF THE HEART IN CHILDREN.

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THESE may be described as neuroses of the cardiac ganglia. They may accompany organic disease (though the diagnosis would be difficult to establish in such cases), but they more commonly ensue in states of general debility, anæmia, and rickets, and they are frequently associated with chorea, or nervous states that border on it.

Assuming that the movements of muscles, voluntary and involuntary, are under the immediate control of the nervous system, we are prepared to understand that if the nerve-tissue is not in a perfectly healthy state, the shortening and contraction of the muscles becomes irregular and incomplete, hence the temporary cessation in the ventricular action of the heart causes irregularity or intermission of the pulse, and arrest of the blood-current, when the nervous force is deficient or momentarily withdrawn.

I will not attempt to explain in what this peculiar state of the nervous system exists, either anatomically or physiologically, for many of its disorders are too mysterious to admit of explanation. Perverted nerve-action in the absence of structural lesion cannot be demonstrated, for every tissue which enters into its composition may be perfectly healthy, and not a vestige of disease discovered by the closest microscopical research; yet it gets out of tune, it disturbs the muscles in their contraction and relaxation, it destroys the energy of the patient, and incapa-

citates him for the fulfilment of his duties. "Every purposive and combined movement executed in the body by muscle is performed through the instrumentality of nerve."¹

I will first speak of these neuroses in connection with functional disorder of the heart, and then allude to the consequences which this condition may involve. I will endeavour to show the influence of digitalis on the circulation in both organic and functional disorders, and to conclude with some general observations.

The symptoms expressive of this neurosal state are too marked to admit of any error in diagnosis if the heart and pulse are carefully examined, and yet these are constantly overlooked, and so in many instances the true cause of weak and delicate health is never ascertained. The symptoms may be briefly summed up without entering into details. The patients are young, from eight to twelve or fifteen years of age, and usually females. They are sometimes hereditarily nervous and weak, of susceptible organisation, easily impressionable, and moved to tears or excitement by circumstances which would have no effect on stronger constitutions. The heart in some palpitates violently from terror or emotion, succeeded by irregularity or intermission. If born vigorous and healthy, then deficient food and bad air will reduce the general strength, and leave the patient exposed to an outbreak of nervous disorders, such as chorea, nervous headache, and fatigued brain from overwork at school, &c. These disorders sometimes induce irregular and excited action of the heart, and so it may be conjectured that the normal blood-supply is repeatedly undergoing variation; or to be strictly accurate, the heart is disturbed in its rhythmical contraction and dilatation as the blood passes through its cavities.

The profession is deeply indebted to Dr. Richardson for his elaborate and scientific explanation of the true cause of cardiac irregularity and intermittent pulse. In speaking of the variation of the pulse-beat he describes—

1. *Acute irregularity*, in which each stroke is given in regular succession, but in series of five, ten, or other number of beats. It occurs in feeble heart, anæmia, and after losses of blood.
2. *Prolonged irregularity*, in which the pulse beats, say, 70 one

¹ *Medical Examiner Lectures on Disorders of the Nervous System.* By Lionel Beale, M.D. (June 27, 1878, p. 547), Medical Examiner.

minute, and the next minute 90 or 100 beats. It may be met with, as Dr. Richardson observes, in acute cerebral disease in children; and he looks upon it as a fatal sign when there are other symptoms pointing to acute hydrocephalus. In a boy two years of age, who came under my care some years ago, with sub-acute meningitis and effusion, this fluctuation was observed in the pulse. The complaint was attended with hemiplegia and involuntary action of the sphincters, but no elevation of temperature. The patient made a slow but good recovery.

3. *Intermittency*, or that form of irregularity in which certain beats of the pulse are lost, "it is as though the pulse were clipped out for the moment, the intermittency of stroke occurring during the whole interval of a normal stroke, or in extreme cases covering the time of two, three, or even a greater number of natural pulsations."

Now this intermittency is attributed by Dr. Richardson to failure of action of the left ventricle, which continues in diastole for two or more strokes of the systole of its auricle, and then relieves itself by a prolonged effort. There is an absence of the first or systolic cardiac sound, a weak second sound, and loss of the pulse. Then comes the returning first sound heavy and strong, because the ventricle has now to contract with greater force to overcome the additional blood in its cavity. This is immediately succeeded by the two quick second sounds (doubling) from closure of the aortic and pulmonary semilunar valves, and then there is a return of the pulse-wave.

The outcome of this irregularity and intermittency of the pulse amounts to this—that it is essentially functional and neurosal; that intermittency is not necessarily connected with organic change, and that in my experience, as in cases I have related, intermission of the pulse in the most advanced valvular disease of the heart and other structural changes is rarely noticed. In organic valvular change it is most frequent in mitral regurgitation.

The irregular action of the heart which sometimes takes place in chorea and in allied nervous affections is doubtless similar in nature to the irritable condition of the bladder in weakly children—the "stammering bladder,"¹ as Sir James Paget happily terms

¹ "On Stammering with other Organs than those of Speech."—*Clinical Lectures and Essays*, by Sir James Paget, Bart., 1875, p. 77.

it—a disorder which that surgeon considers not wholly dissimilar to the stammering of the tongue, and, like it, depends upon some peculiar state of the nervous system. Only the heart is, unlike the bladder, far removed from the control of the will. But on the other hand, the effect of morbid or deficient blood in its cavities might entail results similar to those caused by the irritation of the vesical mucous membrane by urine charged with abnormal constituents.

A highly nervous lady, who was the subject of headache, had an intermittent pulse and irregularity of the heart's action when under examination: she was conscious of discomfort and a feeling as though the heart would stop, but after three or four visits, when she had overcome her terror and dislike of being questioned, her nervous system had so far regained its vigour, that her mind could be directed to her state without causing any return of her heart disturbance. A nervous and delicate lady, aged twenty-two, who had lost considerable blood from abortion, experienced for several successive days, as evening approached, violent palpitation, headache, and a quick irregular pulse. These symptoms were attended with a varying amount of fever. On two occasions the thermometer registered 101° at night, but it usually did not exceed 100° , and fell to normal in the morning, with an abatement of distress about the heart, and a quiet and steadier pulse. Any excitement, or noise, or fasting too long, or eating rapidly would be certain to bring on the attack, and on one occasion the sudden entrance of her maid into her room caused so much alarm that she fainted and became hysterical, after which the cardiac irregularity and febrile disturbance were very troublesome for some time. The symptoms did not cease completely till she had regained a fair share of her strength. The nervous apparatus is easily thrown out of gear from the absence of harmony in its influence over muscular contraction. This nervous constitution is inherited or acquired from illness or other circumstances, and the nervous centres are intensely im-pressible and overcharged, so to speak, with nerve-force.

Cardiac irregularity, then, in children may owe its origin to fright or shock, to rickets, chorea, exanthemata, inflammatory affections of the lungs, as well as to simple anæmia, loss of blood, general debility, and mental weakness. It is common

among delicate children, and those who come of nervous parentage. It succeeds whooping-cough in many instances, and follows chronic enlargement of the tonsils which interrupts healthy respiratory action. I will cite a few cases in point.

CASE I.—E. H., a girl, aged eight, came under my care in November, 1877. She was flogged at school, and became hysterical and so nervous afterwards that she could not study or improve herself. Sub-acute pneumonia in the apex of the left lung followed exposure to cold, and the cardiac sounds could be heard in the left back. The action of the heart was hesitating, and the pulse intermittent about every fifth beat. Under the influence of bromide of potassium, phosphate of iron, and cod-liver oil, the lung cleared up, the heart became steady, and no irregularity could be detected after two months' treatment.

CASE II.—G. C., aged four, a delicate boy from birth, with phthisis on the mother's side, came under my care in May, 1877. The chest was pigeon-breasted and prominent along the centre, the forehead was arched, and the veins of the scalp full. The heart's impulse was weak, and the pulse irregularly intermittent. Temperature normal; urine clear on standing, and non-albuminous. After good diet, and a mixture of digitalis, strychnia, and iron, the pulse became quite regular and averaged ninety per minute.

CASE III.—E. J., aged eight, a girl, came under my care at the Samaritan Hospital in April, 1877, suffering from anæmia and chronic pneumonia. Her mother stated that she had had scarlet fever three years previously, followed by dropsy, and had not been well since. The urine was now non-albuminous. There was dulness on percussion throughout the left lung, with bronchophony; there were cough and expectoration, but the temperature was normal. The action of the heart was slightly irregular, there were three or four regular pulsations, followed by an intermission; the pulse was weak and jerking, followed by collapse, or a sudden emptying of the artery, when it would resume regularity for a few beats. On May 1st five minims of tincture of digitalis were given three times a day, and at the end of a week the pulse fell to 65 per minute when in bed. On the 10th, when the patient was allowed to be about the ward, it averaged 80 without intermission, and again averaged

65 when the patient returned to bed. A slow pulse is frequently observed in these conditions, but it should be remembered that the pulse of a healthy adult male, according to Dr. Guy, averages 67 in the recumbent posture, 70 sitting, and 79 standing ; so that we must not hastily ascribe to the drug what may only be a normal condition after all.

CASE IV.—L. C., a girl, aged five-and-a-half, was admitted under my care into the Samaritan Hospital in October, 1876, with what is recorded as anæmia and irritable heart. She had never had scarlet fever, measles, or whooping-cough. For three months before admission she had been wasting, she was restless at night, and screamed in her sleep. The glands of the neck were enlarged on each side, but the lungs were healthy, and the temperature normal. Although excessively weak and pallid, no cardiac murmur could be detected. The pulse averaged 68 to 72 ; it was small and thrilling, and occasionally intermitting, as though the blood was jerked spasmodically into the vessel, and the heart hesitated in some of its contractions. The urine contained a few phosphates. She was given nux vomica and iron, and a month later there was no intermission, but the heart's action was tumultuous, somewhat heaving, with just that degree of feeble force against the parietes which leads to weakness or dilatation, when it works too rapidly for any great length of time.

CASE V.—F. P., a girl aged twelve, was admitted under my care into the Samaritan Hospital with debility and enlarged tonsils January 1, 1876. Had whooping-cough when three months old, and scarlet fever when three years old. The heart's action was excited, and could be seen vigorously acting beneath the thin walls of the thorax. The first sound was longer, more abrupt and pronounced than normal, and this was best heard over the apex of the heart, which was felt beating in the fifth interspace just below the nipple. Below and to the left of the nipple the first sound was a little blowing and muffled. The second sound came like a heavy thud against the ear, due to the semi-lunar valves being violently closed. This sound was not so distinct at the base of the heart. The heart's action was distinctly heard at the inner angle of the left scapula. This vibrating sound was heard over the exposed region of the chest where the lung did

not cover it. A piece of linen rag prevented this sound when interposed between the stethoscope and the body. The pulse was small, compressible, and rather thrilling; and there was an intermission at every fourth beat. Iron and strychnia were prescribed. Ten days later the report states that no irregularity in the pulse had been detected the last few days, but on February 9th the intermission was recognisable; the pulse would beat regularly for four beats, then stop one beat, and go on regularly again for as many as fifteen beats, and then intermit; or beat four beats regularly, followed by the fifth and sixth, which only occupied the length of one beat. The irregularity was very great; thus out of 81 beats in the minute which were counted in the recumbent posture, there were nine beats in regular succession, then an interval, then six (interval); then five (interval); then one (short interval); then two quick pulsations; then four (interval), then five (interval), then fifteen (interval), then nine (interval), then four (short interval), then three (interval), then four (interval). In counting the pulse for more than eight minutes, I found the regularity to be continuous for twenty strokes once, and for fifteen twice. Every fourth or fifth beat was the most frequent intermission.

Intermission like palpitation is common both in functional and organic disease of the heart. As neither are necessarily signs of structural change, undue importance must not be assigned to them. When intermission is present in the latter condition it is serious, because it denotes imperfect contraction of the auricles, and, not filling the ventricles properly, the latter have to wait till the auricular supply is sufficient. Hence this is one cause of intermission.

Dr. B. W. Richardson relates a case of intermittency of the pulse observed in a child on the day of its birth, the child being otherwise healthy. This continued till it was five years old, when it gradually disappeared.

CASE VI.—A. B., aged eleven, was admitted into the Samaritan Hospital under my care, December 15, 1876, with chorea. It was stated that three months before when walking in the street she fell down suddenly in a fit, and she became ill afterwards. She never had rheumatism, and was never frightened. She was thin, pale, and delicate, with large grey eyes and dilated

pupils. Her chief symptom was incessant agitation of the limbs, particularly on the right side, and as she could not walk across the room without assistance, she was kept in bed. The heart's action corresponding to the position of the right ventricle was visible to the eye, and felt with tremulous agitation against the hand. The apex beat was felt two inches below the nipple between the sixth and seventh ribs, but it did not exceed an imaginary line drawn vertically downwards from the nipple. A loud systolic murmur was heard over the pulmonary artery, tricuspid orifice, and mitral valve. It was softest over the pulmonary artery, most bellows-like over the tricuspid, and less bellows-like over the mitral valve. The heart's impulse was rather short and sudden, and therefore not strong. The jugular veins were full on both sides of the neck, the lungs were normal, and there was no abdominal disease. There was an irregular intermission in the pulse about every fifth beat. Urine normal. Pulse 100 in the recumbent posture; the patient was kept in bed. The diet consisted of milk and beef-tea. Five minims of tincture of digitalis were given in water three times a-day, commencing December 26th.

December 28th (p. 84), irregularly intermittent.

January 3rd (p. 60), scarcely irregular.

January 5th (p. 52), very small, but scarcely intermittent.

Ten minims of liquor ferri perchloridi and two minims of liquor strychniæ were added to each dose of the mixture.

January 8th (p. 72), more regular and of much better quality.

January 10th (p. 68), slight intermission.

January 11th, 12th, 13th, 14th, 15th (p. 68), no intermission—much improved: an occasional soft murmur now heard over the tricuspid orifice—over other orifices the same.

NOTE.—The chief point of interest here is the effect of digitalis in reducing the frequency of the pulse, bringing it down too low for the remedy to be safely continued alone, and rendering it smaller but less intermittent. I would not make such an assertion as this on the evidence alone of this case, if I had not met with similar instances.

Now as the patient's circulation had improved and the pulse kept steady at 68, I allowed her to be out of bed each day for an hour or two, and the effect of this slight exertion was to

increase the pulse rate to 82, without doing her any harm, a greater difference than ought to happen in a healthy heart. On sending her to bed again the pulse soon fell and averaged from 68° to 72° , without intermission, till she was discharged in February, thus showing the importance of rest in these cases, not only for the choreic condition, but when the heart has to regain lost power. The importance of rest in such a case as this is not to be measured by weeks but rather by months, and from what I have seen in private practice, this is the remedy to advise—rest that the heart may have time to recover its lost tone, and repair its imperfect contractile power.

Now I think without entering at any length into the question, we may establish a few conclusions with regard to the action of digitalis in these cases.

1. That when the heart's action is weak and intermittent digitalis should be given with caution, whether the weakness and intermission depend on organic change, or whether they are purely neurosal.

2. If the heart's action is quick, though weak and intermittent, digitalis may be serviceable by reducing the frequency of the cardiac contractions, and lengthening the diastole; if the heart is slow and feeble in its impulse digitalis ought not in my opinion to be administered alone, but should be given with a remedy like iron or strychnia.

3. In palpitation, from purely neurosal affections of the heart, with the heart's action hard and hammering, as in some cases of chorea and Grave's disease, bromide of potassium does good, and not digitalis. Hence, digitalis is unwarrantable in simple hypertrophy, but when dilatation is combined with it, it is of service.

4. When there is weakness of the muscular structure combined with palpitation, belladonna, or digitalis with bromide of potassium, or iron, or strychnia, are of service.

5. In palpitation produced by muscular effort, digitalis is of less service, and often does harm. In muscular inefficiency, when the heart does not empty itself at every systole, and arterial pressure is low, then it does good.

The opinion is almost universally received among medical men, that digitalis has a direct and powerful influence upon the circulation and heart's movements; that whilst it lessens

the frequency of the ventricular contractions, it increases their power and regularity. Each systolic effort is more perfect and complete, just as a strong hand can squeeze the last drops from a sponge, and a weak hand cannot exert the necessary strength. Digitalis propels the blood with greater force into the aorta, and the muscular structure of the heart is better nourished. When uncombined with any other drug the action of digitalis, if it did not reduce the pulse rate, was rather negative than otherwise; when the pulse was quick it never caused any bad effects. If it did not reduce the frequency of its beats, it produced no nervous symptoms or uncomfortable sensations. In the case in which it was given till the pulse fell to 52, it manifestly failed to improve the force of the heart's contractions, and if continued it would have been prejudicial. The case of mitral regurgitation with dilatation of the right heart, justifies me in saying that the remedy was of signal service in steadying the heart's action, and rendering the pulse stronger and more regular as long as the patient was carefully watched, and rest and diet were strictly observed. But I am bound to admit from my own experience, that its good effects have not been realised when given alone in these neurosial cases. In combination with iron or strychnia, I have found it invaluable in some functional and organic diseases of the heart, also in simple dilatation and mitral insufficiency, but the result, moreover, has been negative when these last drugs have been employed without the digitalis.

In no instance in which I have employed digitalis in these cardiac affections did it appear to have any influence on the urinary secretion, neither increasing its quantity nor changing its quality.

The physiological action of some of the most important drugs in use is subject to much uncertainty and doubt. Our daily experience of them tends to make us sceptical when we do not obtain the results we are led to anticipate. It may well do this if, as in a case which came recently under my notice, sixteen drachms of the tincture of conium, obtained from a chemist of good standing, were given to a girl suffering from chorea, in the space of twenty-four hours, without exciting any good or ill effects whatever—no nausea, no dryness of the throat, no disordered vision, no giddiness—in short, no therapeutic action. The tincture

when not recently prepared is an uncertain preparation, whatever may be said of the extract, and the same remarks probably apply to digitalis. As it is not possible for every medical man to know the quality of the drug he prescribes, it follows that we are in constant danger of drawing conclusions which are altogether unwarrantable.

There are many accidental circumstances to influence the pulse-rate in children, even more so than in adults. Food, drink, emotion, excitement, conversation, and position are well-known causes that operate in this direction, which should make us chary in drawing references as to the action of a particular drug like digitalis. If we feel the pulse of any person, and cough and excitement are induced, its frequency is increased, and it may be its intermission or irregularity if these have been previously noticed. For days and even weeks together, I have employed digitalis in many cases without being able to satisfy myself that the remedy had in any way altered its quality or frequency, whilst in other cases I have seen it followed by perceptible results. In respect to its influence on the heart and cerebral circulation in young children, digitalis should not be over-estimated, and, indeed, I think that positive results cannot be invariably predicted from it, even in those diseases of the adult for which it is especially adapted. Indeed, I have often thought it impossible to draw any conclusions from the rate of the pulse, as in healthy persons it varies a good deal. In some men it averages eighty or ninety per minute, and in others it does not exceed sixty. In women and children it is habitually quicker than in the male sex. I gave a grain of powdered digitalis with two grains of rhubarb, three times a-day, to a lady suffering from nervous and anæmic headache. It relieved the pain, but it had no effect in reducing the frequency of the pulse. In these cases there is little chance of lowering the pulse till the general condition is improved. This prescription was tried several times with the same result.

Dr. Broadbent says, "Intermission of the pulse is rare in young people, and I should think more seriously of it in early life."¹ Irregularity or irregular intermission, I should say from

¹ "The Pulse: its Diagnostic, Prognostic, and Therapeutic Indications." *Lancet*, Sept. 25, 1875, p. 442.

my experience, to be exceedingly common among children, and due to the causes I have already given. Now in these cases of intermittent pulse without cardiac change, neurosal in fact, I have several times given bichloride of meythlene, in small doses, with the effect of temporarily removing the intermission or irregularity. But in a few cases its action has been the reverse ; and these have been instances, I think, in which fatty change has taken place, and the impulse has been weak against the parietes. The heart's action is frequently stimulated by the inhalation of the anæsthetic, the force of the left ventricle is improved, and the blood pressure is raised. I cannot say that I have so often noticed the pulse lose its irregularity under the anæsthetic, when it has been due to mitral regurgitation and hypertrophy, for the amount of blood in the different cavities of the heart being subject to so much variation, excites the walls to irregular action.

The remedies which possess the most certain and direct influence over this irregular and intermittent action of the heart in children are those which increase the power of the circulation, and improve the quality of the blood. For this purpose our selection must be made from the tonic class that we may restore nutrition, and avert the tendency to debility. A combination of iron, strychnia and digitalis has fully answered my expectation in these cases. Their good effects are certain and permanent. For the intermissions accompanying anæmia and chorea, these drugs occupy the first place. As the iron increases the number of red corpuscles in the blood, the quality of the fluid becomes enriched, the lax-tissues are made more contractile, and the nervous system is further steadied and strengthened by the other two drugs.

The syrup of phosphate of iron, steel wine, quinine and cod-liver-oil figure among the list of valuable remedies to be selected according to the particular indications of each case. Steel wine and arsenic is a very suitable combination for children, increasing the strength of the muscular system, and greatly improving the appetite and digestion. When choreic movements are threatening, and cachexia is denoted by sallowness of the complexion and a general want of tone in the system, these drugs in combination exert a remarkably beneficial effect when steadily continued.

Warm clothing, good food, and rest are to be strictly carried out, for the heart is fidgety, and prone as it were to take offence at the least irritation. It flutters and trembles under any degree of emotional excitement, just as the cranial nerves ache at the receipt of bad, or worrying news; and a delicate stomach ejects food which is not of the simplest character.

Notwithstanding these instructions, the symptoms will not yield, if the patients are kept too closely at study and school work. Sleep will be broken and unrefreshing, nervous exhaustion will increase, and the heart will become more and more unsteady.

As to diet this is of paramount importance. It should be of the most nutritious character, and given in small quantities at a time so as not to overload the stomach, for if the patient goes too long without food, exhaustion ensues, and during digestion the stomach is taxed to the utmost, oppression of the stomach follows, and vomiting with increased agitation of the heart comes on. Wine or brandy, where the irregularity is great, and the heart consequently weak, is a valuable addition to the treatment.

When we have neglected to make a careful examination, and to form a diagnosis, we are too disposed to attribute the chronic ill-health of children to debility, a word comprehensive enough when the bodily powers are uniformly depressed, but which skips over the ground of scientific precision, and conveys in a large number of cases nothing definite or exact. Debility is one link in a long and intricate chain of morbid phenomena. It is present in anæmia when the blood is healthy but deficient, it is observed when the blood is diseased, as in albuminuria, and the heart is over excited and disturbed by it. Some cases of heart affection when advanced to a certain stage speak for themselves by general constitutional symptoms, and our diagnosis is made complete by inquiring into the physical changes which accompany them. But there are other (and the class is numerous) in which the symptoms are obscure, and *a minute inquiry* into mental and physical phenomena *is our only guide* to escape the charge of ignorant speculation, or hasty observation. All the functions of the body must be separately examined and inquired into, lest we omit something important which we ought to detect.

Reviews.

Atlas of Diseases of the Skin. By BALMANNO SQUIRE, M.B.
Part I. London: Churchill.

Two plates represent *Nævus*. A third, the author tells us, represents *Psoriasis diffusa* of the face, which we certainly should not have discovered by an examination of the plate itself. The fourth is unique of its kind, being the face of a common-place youth, drawn without art, and coloured in the style of public-house sporting prints. We learn from the author that this picture represents "*Psoriasis after treatment*;" and we do not see why by simply altering the name this valuable illustration should not do duty for any conceivable skin, or other disease, *after treatment*. Such vulgar appeals to the imagination are inconsistent with the professedly scientific character of the work.

Atlas of Skin Diseases. By LOUIS A. DUHRING, M.D. Part III.

THE third part of Dr. Duhring's *Atlas* consists of portraits of eczema squamosum, syphiloderma erythematosum, purpura simplex, and syphiloderma papulosum et pustulosum. The artistic excellence and accuracy which are characteristic of the first two parts of this *Atlas* are maintained in the present fasciculus. Members of the profession, who have limited opportunities of observing skin diseases, will find these plates instructive and reliable.

Clinic of the Month.

How to restore the apparently Drowned.—Under this heading Dr. Howard has issued the following directions for carrying out what he terms the “direct method.”

1st. *Instantly* turn the patient downwards, with a large firm roll of clothing under the stomach and chest. Press with your weight two or three times, for four or five seconds each time, upon the patient's back, so that the water is pressed out of the lungs and stomach, and drains freely downwards out of the mouth. Then

2nd. *Quickly* turn the patient face upwards, the roll of clothing put *under his back just below the shoulder-blades*, the head hanging back as low as possible. Place the patient's hands together above his head.

Kneel with patient's hips between your knees.

Fix your elbows against your hips. Now, grasping the lower part of the patient's chest, squeeze the two sides together, pressing gradually forward with all your weight, for about three seconds, until your mouth is nearly over the mouth of the patient; then, with a push, *suddenly* jerk yourself backwards. Rest about three seconds, then begin again.

Repeat these bellows-blowing movements so that the air may be blown into the lungs about eight or ten times a minute.

Remember the above directions must be used *on the spot*, the instant the patient is taken from the water. A moment's delay, and success may be hopeless. As soon as the water is pressed from the lungs, all clothing should be ripped away from the chest and throat. In making the pressure either for the removal of water, or for breathing, increase it *gradually* and thoroughly, and *suddenly* let go with a jerk. With women and children use less force.

Do not stop these movements under an hour unless patient breathes. Be careful not to interrupt first short natural breaths. If they be long apart carefully continue between them the bellows-blowing movements as before.

After breathing is regular, keep patient warm with blankets,

rubbing with warm hands, &c. Prevent crowding around patient, plenty of fresh air is all-important.

Spirits and water only, in occasional small doses, may now be given, if hot the better. After this encourage quiet and sleep. (*Lancet*, Aug. 10, 1878.)

Treatment of Acne.—Dr. James Cumming of Edinburgh, after referring to the various forms of, and the methods of treatment that have been adopted in, acne, records the details of a severe case that occurred under his notice in a woman *ætat.* forty-one of acne induration. At first sight he felt he should be justified in employing what some might regard as the rather heroic treatment of scarifying the papules previous to applying some lotion or ointment. But the mere mention of scratching the skin (as he mildly expressed it), so alarmed his patient, that he resolved to commence with mild measures. Accordingly he directed to be *well* rubbed in with the finger, or a piece of flannel, each night an ointment consisting of milk of sulphur, glycerine, carbonate of potass, and benzoate ointment, of each two drachms. She was to begin by applying this ointment to a small area on the right cheek about the size of a sixpence, and to take twenty drops of perchloride of iron thrice daily. He saw her again a few days later, when she bitterly complained of the pain caused by the ointment. For a short time the ointment was rather grateful than otherwise, but as soon as she approached the fire the smarting commenced, lasting for several hours. On close inspection the part appeared less inflamed and felt less indurated, so she was encouraged to persevere, with the hope that in the course of time a large extent of surface might clear up. He did not see her again for three weeks, when he was agreeably surprised to find a considerable portion of the right cheek presenting a normal appearance, circulating outwards from the area first improved. The patient continuing the use of the remedy, a cure took place in ten weeks, and no return had taken place in four years. (*Lancet*, Aug. 10, 1878.)

Arrest of Milk Abscess.—Mr. W. P. Swain of Devonport reports an interesting and well-marked case of arrest of milk abscess without, however, any novelty in the method of the treatment adopted. The patient was a primipara who was delivered of a child with the aid of forceps. Thirteen days after she had a rigor followed by heat with fulness, pain, and great tenderness on pressure of the right breast. This breast had been somewhat troublesome to nurse with throughout. The aspect of the patient became flushed and anxious, the pulse 120, and the temp. 103°·6 F. The breast was very full, tense, and painful, especially towards the axilla, where a spot much harder than the surrounding tissues could be felt. The following treatment

was prescribed. An immediate dose of ten grains of quinine; two drop doses of tincture of aconite in a drachm of water every ten minutes for four hours, and then every hour; and the extract of belladonna softened with a little glycerine to be smeared over the breast. The breast was also ordered to be used. In the course of nine hours the breast had become much less tender, the pulse 88, and the temp. 101° . Five grains of quinine were ordered to be taken every four hours, and the aconite to be continued every hour. On the following day the patient was in all respects more comfortable. The child had taken the breast, which was now hardly at all tender, the hard spot having vanished. The pulse was 80 and the temp. $99^{\circ}6$. From that time she progressed favourably. (*Lancet*, Aug. 10, 1878.)

Ergot in the Treatment of Megrin.—Dr. Schumacher thinks that the view of the nature of megrim which attributes it to an affection of the cervical sympathetic is the most plausible. Du Bois Reymond and Brunner, themselves subject to the disease, assume as its immediate cause a tetanic contraction of the cerebral vessels, due to an irritation of the vaso-motor nerves, whereas Möllendorf holds that it proceeds from dilatation of the vessels in consequence of a paralysis of those nerves. Both views seem correct, and there is, Dr. Schumacher believes, every reason to admit the existence of two forms of megrim, an angio-tetanic and angio-paralytic. The treatment must consequently vary according to the nature of the case, for while the angio-tetanic form of the disease would be relieved by nitrite of amyl, the angio-paralytic can be benefited only by such remedies as serve to contract the cerebral blood-vessels. Upon this ground Eulenburg recommended ergot of rye in the treatment of the latter form, and the favourable results obtained from the exhibition of that drug have been confirmed in America, England, and Germany. Dr. Schumacher gives the details of a case of angio-paralytic megrim in which, in an otherwise exhausted patient, severe pain usually came on after midnight, and in which soda, rhubarb, morphia, and caffenin gave no permanent relief; but six grains of ergotine given every day at first, and subsequently increased to fifteen grains, was followed by abatement and then by complete relief. The remedy was continued for about a month. During that time the ergotine produced no disturbance of the general health, while the headache gradually subsided. She took seven drachms of ergotine in a very short time, and has ever since been free from any angio-paralytic symptoms. (*Lancet*, August 17, 1878.)

Treatment of Herpes Zoster.—In reply to a question put by a correspondent of the *Lancet* requesting information in

regard to the treatment of herpes zoster, Dr. Piggott, of Shepherd's Bush, suggests the employment of the tincture of gelseminum, which he finds almost invariably gives relief in cases of facial neuralgia, whether dependent on exposure to cold or carious teeth. He gives it in doses of from fifteen to twenty minims, combined with the same amount of spirits of chloroform, every three or four hours. Mr. Startin, again, recommends the application of finely-powdered acetate of lead and calamine, in equal parts, to allay irritation, and a saline acidulated mixture to be taken with a few drops of wine of colchicum. Dr. Campbell, of Lewisham, suggests the exhibition of twenty-five grain doses of muriate of ammonia three times daily, for three or four days, followed by a short course of saccharated carbonate of iron. Dr. Hughes, of Llanberis, writes recommending hypodermic injections of morphia, and that the patient should take cod-liver oil. (*Lancet*, August 17, 1878.)

Treatment of Acne by the Internal Administration of Calcium Sulphide.—Dr. Howard Cane, of St. Alban's, states that he has obtained considerable success from the employment of sulphide of calcium in acne. It appears to have been recommended some years ago by Dr. S. Ringer. Dr. Cane combines it with a few grains of powdered loaf-sugar, which he has found better than the sugar of milk usually prescribed. Directions should be given that the powders be kept in some nearly air-tight receptacle, and the patient should be cautioned not to wear metallic ornaments during the treatment. In one case, of which he gives the details, he prescribed at the commencement of the treatment one-tenth of a grain four times daily, with four grains of powdered loaf-sugar. At the same time she was directed to hold her face over a vessel containing very hot water night and morning, for some ten minutes or more, and then to rub the parts where the little black-topped comedones were very thick with a towel, after which she was to use as a face powder some precipitated sulphur, coloured with Armenian bole. Pastry and flour puddings of all kinds were interdicted, together with salt meats, whilst the use of fresh green vegetables was enjoined. By gradual increments the dose was raised to one grain six times daily. Perfect recovery followed. (*Lancet*, August 17, 1878.)

Extracts from British and Foreign Journals.

Experimental Inquiry into the Muscular Element of the first sound of the Heart.—Dr. Arnold, the Professor of Physiology in the University of New York, gives the result of an experimental inquiry he has recently made in regard to the influence of the muscle sound in the production of the first sound of the heart. After noticing the great discrepancy of opinion and statements on this point, he gives an account of the course he adopted, which consisted—(1) In recording the form and duration of the heart's contraction. (2) In comparing the form and duration of the heart's contraction with that of the gastrocnemius or other voluntary muscle. (3) In listening to the sounds of the heart under varied conditions, and lastly in examining the electrical condition during its systole. The form and duration of the cardiac and other muscular contractions were obtained by taking tracings on a Secretan's cylinder with Foucault's regulator, the motion being transmitted by Marey's improved tambours; a chronograph recording 1-100th of a second marked time. The several experiments are given in detail, one of them (No. 10) was performed on a medium sized dog under the influence of wourara. The heart sounds had previously been carefully listened to with single and binaural stethoscopes. The heart was exposed and maintained its action well under artificial respiration. Both forms of stethoscope were applied directly to the substance of the heart, and then first and second sounds were distinctly heard. The heart, still contracting vigorously, was now rapidly cut out, and the stethoscopes immediately applied; the first sound still continued, whilst the second had entirely disappeared. Introducing through the auricles a sharp knife, the auriculo-ventricular valves and chordæ tendinæ were completely destroyed, as an after examination proved; the stethoscopes were now again applied to the still contracting organ, when a distinct sound was heard both by Dr. Arnold and by Dr. M. N. Miller. The chronographic tracings showed that the average time for the total contraction of the gastrocnemius of the dog is 0.21665 sec., the contraction itself occupying 0.1279

sec., and the relaxation 0.08875 sec. The dog's heart has a duration of 0.29925 sec. for the entire contraction, while the contraction minus the relaxation is 0.14566 sec., the relaxation taking 0.15359 sec. The difference in time between the contraction of the dog's heart and gastrocnemius is, for the entire act 0.0822 sec., for the contraction alone 0.01776 sec., and for relaxation 0.06484. It is very evident that the time occupied by the heart is longer than that of the leg muscle, the entire difference being 0.082 sec. The time occupied by the systole of the human heart cannot be measured directly, but by an ingenious method, Donders has arrived at results which are undoubtedly very accurate. His plan consisted in the measurement of the interval between the first and second sound and the relation between this and the whole cardiac period, and shows a duration of 0.309 sec. to 0.327 sec. His results are supported by the observations of Thurston, obtained by a totally distinct method. The duration of a muscular shock in man is from 0.08 to 0.1 sec. for the contraction without relaxation; allowing the entire time of contraction and relaxation as 0.30 sec., which would represent the maximum, we still have left 0.027 sec. for the heart, over and above that of the ordinary red muscle. The great duration of the cardiac systole in the horse with its accompanying intensity of sound on auscultation should be borne in mind. A comparison of the muscular curve of contraction of the ventricle in the horse and dog with the curve as seen in the muscles of the leg, points quite decidedly by its flattened top to the continued contraction, necessary to produce a muscular sound. The fact that the fibres of the heart are arranged in layers; which must be thrown into a state of extreme tension, lasting for more than one-third of a second in the case of the horse, is, Dr. Arnold observes, additional evidence. From a consideration of all these facts, he asks whether the conclusion may not be legitimately drawn that there *does* exist a muscular element in the first sound of the heart. (*New York Medical Journal*, April, 1878.)

Chlorhydrate of Pilocarpine in Ophthalmic Practice.—

Dr. Alexandroff states that Jaborandi for various reasons is not well adapted for administration; it has a disagreeable taste, it sits uneasily on the stomach, causing nausea, vomiting, and sometimes colic; it produces vertigo and fainting, and lastly it has the disadvantage of being inconstant in its action. Pilocarpine the active principle of Jaborandi—discovered by Hardy in 1875—is free from some of these inconveniences, and its action has been studied on patients affected with rheumatism, albuminous nephritis, and pleurisy; but until his own observations, no attempts had been made, M. Alexandroff states, to ascertain its

physiological value in diseases of the eye, except those of M. Wecker, who treated a few cases by hypodermic injection of the chlorhydrate. M. Alexandroff determined to investigate its action, and tried it first in a case of rheumatismal irido-choroiditis. The case was sufficiently severe to induce M. Metaxas to recommend iridectomy, to which the patient refused to submit. About 2 centigrammes of the chlorhydrate of pilocarpine in solution in water was, with M. Melaxas' permission, injected by M. Alexandroff into the arm of the patient, atropine being at the same time instilled into the eye. The patient passed a better night and was free from pain; on the following day the injection was repeated, and again at intervals on five occasions. Under this treatment the media became clear, the ulcer which had been present healed, and vision was completely restored. M. Melaxas tried the chlorhydrate again in a second case of double rheumatic iritis with equal success, and it was afterwards tried not only in many cases of rheumatic iritis, but in retinal hæmorrhage, and in exudative choroiditis with good effect. In all instances salivation and sweating appear to have been produced, diarrhœa was occasionally observed. Epiphora was constant. The pulse and temperature rose immediately after the injection. He thinks it has an indisputable action on the iris, and finds that it acts more rapidly than eserine. It is at once the antagonist and antidote to atropine. It occasionally produces severe præcordial pain and feeling of anxiety. He thinks it will prove valuable, not only in cases of rheumatic iritis, but in all cases when the area of the pupil, the choroid, and the retina are the seats of serous or plastic exudation either from local or general disease. (Pamphlet, Marseilles, 1877.)

Hypodermic Injections of Sulphuric Ether.—Dr. Schautrenboch di Monaco first recommended this method of treatment in 1872, as a remedy in severe cases of adynamic fever, and Duprey carried out the suggestion in 1873. Ocounkoff has made researches on the subject and concludes that ether when injected under the skin in doses of two or three grammes augments the temperature and the arterial blood pressure, increases the secretions throughout the body and causes agitation, hyperæsthesia of the senses and of the skin, with dilatation of the pupil. The subcutaneous injection of ether may be employed with advantage in surgical hæmorrhage, in puerperal hæmorrhage, and in particular in hæmorrhage taking place on the field of battle where transfusion of blood is impracticable. (*Thèse de Paris* and *Commentario Clinico di Pisa*, 1877, Anno 1, No. 9.)

Treatment of Onychia Maligna with Nitrate of Lead and Morphia.—Dr. Ceccato Gaetano reports three cases of

onychia maligna in which he first applied a strong solution of sulphate of morphia to the diseased finger, and when the sensation was thoroughly dulled, dusted over the part some nitrate of lead in powder; no pain, or only slight pain was experienced. In the course of a few days the crust was removed, and a healthy cicatrized surface was left. (*Il Morgagni*, 1877, p. 451.)

Poisonous Action of Lupin used as a Vermicide.—Dr. Raffaele Donnabella makes some observations on the toxic effect of decoction of lupin used as a clyster for the cure of intestinal worms. He was himself the patient, and having become the subject of oxyurides, which proved an intolerable nuisance, he tried injections of weak acetic acid and other fluids without success. At length meeting in a manual of materia medica with the statement that injections of decoction of lupin were capable of destroying thread worms without injurious effects on the patient, he determined to try it, and injected into the rectum about four or five ounces of the decoction. In the course of a short time he began to feel general malaise, uneasiness of the head, obscuration of vision, heaviness of the lids, vertigo, exaltation of the intellectual faculties, sense of constriction of the larynx, and an almost convulsive state of the muscles of the pharynx. His colleagues now came to his aid, but their measures afforded him but little relief; vomiting supervened; he placed himself in a hot bath and with the aid of diligent friction slowly recovered. Several months afterwards he repeated the experiment with the same results, and he therefore recommends that this poison, of which we know neither the nature nor the antidote, should be banished from the list of drugs that should be employed. (*Ibid*, 1877, p. 454.)

Therapeutic Action of Sulphate of Copper.—Dr. G. Levi and Dr. D. Barduzzi in an article on this subject, remark that the use of copper in medicine mounts to remote antiquity, having been used in Egypt, and by the Arabs and the Greeks, and that then having for some centuries fallen into oblivion it was again brought into use by V. Helmont, Stissero, Boyle, and Boerhaave. It was however used with much timidity by practitioners on account of the poisonous action known to be possessed by some of its salts. Millon, Béchamp and others, however, showed that it was, occasionally at least, a constituent of the body, and that it existed in some highly esteemed mineral waters, as in those of Trianon and Luxeuil, Buckenau (Bavaria), Ripoldsau, Valmont, Aix-la-Chapelle, Wiesbaden, Baguères, Levico, and many other waters, in fact, which contained but small proportions of iron, but which had been found serviceable in various constitutional affections, as in syphilis, in grave anæmia, chlorosis, and lymphatismus. In 1789 Wright

employed it as a diuretic in dropsy, and subsequently it was recommended by Hufeland in severe neurosis; by Winter and others as a specific in epilepsy, and by others in catalepsy and chorea. Brera used it in gastralgia with success, Steinbach in pertussis, Storer in hysteria, and Brendt in diabetes. The general result of the observations made by these authors was to show that copper possessed a well-marked anti-neuralgic and anti-neuritic action, and that it was capable of modifying various conditions of innervation. Subsequently Guersent and Pecholier obtained excellent results from its use in scrofulous and rachitic diseases, whilst Rademacher, Gubler, and Schroeder v. der Kolk found in it a reliable and powerful hæmatinic and general tonic. The celebrated powders of Smith used in intermittents and in obstinate remittent fevers, contained ten parts of sulphate of copper, one part of kino, and two parts of gum-arabic. The statements of veterinary surgeons are unanimous in favour of the value of sulphate of copper in glanders, farcy, anæmia, hydræmia, and in inveterate cutaneous diseases. The opinion expressed by Barrallier, that small doses of sulphate of copper act silently, and permit the metal to be placed as a pharmaceutical agent by the side of silver, platinum, gold, manganese, and even iron, has received support from the discussion lately carried on in the Society of Biology of Paris; for whilst Christison, Orfila and others, appeared to have established without a doubt the toxic action of sulphate of copper, Bourneville gave no less than 1,000 grains to an epileptic in the course of 151 days, and when death at length occurred from other causes found that the mucous membrane of the intestine presented no structural alteration. Drs. Levi and Barduzzi undertook some original investigations on this subject and found that the salt might be given in considerable doses without injury to the horse, ass, dog, and to man, that it was not only tolerated by the stomach and intestines, but that it increased the activity of the nutritive processes, and that it might truly be called a "re-corporant." These effects they attribute to its causing excitation of the gastric secretion, and at the same time exerting an astringent action on the secretory tracts and on the vessels, everywhere augmenting the contractility of the unstriated muscular fibre, thus effecting a more complete performance of the digestive process, in consequence of which again more material is absorbed and thrown into the circulation. In addition the mucous membranes in animals together with the skin in man become redder and more vascular, enabling the blood to take up more oxygen. The authors then give the results of their clinical observation. They began by giving about one-sixth of a grain of the sulphate in pill, increasing it in most instances to about two-thirds of a grain, and they obtained satisfactory

results in cases of pellagra, herpes zoster, ecthyma, eczema, nervous cough, pulmonary tubercle, bronchial catarrh, &c., and they strongly recommend its more extended trial in other affections requiring a profound modification of the nutritive functions. (*Commentario Clinico di Pisa*, Anno 1, No. 9, 1877.)

Treatment of Typhoid Fever.—Dr. William Pepper in a clinical lecture remarks that in the second week of the disease, when the abdominal symptoms of pain and diarrhoea have fully set in, one-quarter of a grain of nitrate of silver with one-twelfth of a grain of belladonna, and from one-sixth to one-half of a grain of the watery extract of opium, should be given in pill form three times a day, after meals. Under this treatment diarrhoea and tenderness diminish, and patients make very rapid recoveries. In most cases very little stimulant is used. Milk and beef-tea are the only articles of food he allows. Quinia is given with other tonics. Fever is reduced by frequent spongings of the skin of the entire body. When the high fever resists sponging, cool baths are employed. Indiscriminate bathing in typhoid fever is often extremely injurious. The best time for the use of the cold bath is in the early stage, during the first week or ten days. In cases where the temperature rises above 103° , and is not controlled by frequent spongings, large doses of quinia (quinia acts most admirably, both in this and other diseases, as an antiphlogistic) diaphoretics, &c. When the fever in subsequent stages runs high, it is of the nature of a sympathetic fever, largely dependent on the amount of intestinal lesion; hence cold baths are less valuable at that time and attended with more risk. Nitrate of silver is used both with the hope of limiting the amount of the specific follicular catarrh of the intestines, and with the intention of favourably modifying the secondary sympathetic symptoms. The very best results are also obtained by the continued use of nitrate of silver in chronic inflammation of the bowels, and in gastric ulcer. The nitrate is given in doses of a third of a grain a couple of hours after meals. Dr. Pepper has cured *thirty-nine* out of *forty* cases of typhoid fever in which it has been employed by this nitrate of silver treatment. (*The Boston Medical and Surgical Journal*, October 25, 1877.)

Belladonna in Infantile Diseases.—In a clinical lecture, delivered at the Hospital des Enfants Malades, M. Jules Simon gave the following summary of the physiological action of belladonna. In some respects the action of belladonna is opposed to that of opium. Applied locally to a blistered surface of the skin, or to the mucous membranes, belladonna is irritating, as is shown by the action of a strong solution of atropin on the conjunctiva. Hence it has been placed amongst the acro-narcotics.

In small doses, by its action on the pharyngeal mucous membrane, it produces dryness, inability to speak clearly, and dysphagia, and in large doses it causes nausea, vomiting, and diarrhoea. At first the pulse is rendered slower and harder, but with a higher degree of action the pulse becomes full, strong, and frequent; the temperature rises a little; there is redness of the face, and brightness of the eyes, with mydriasis. The respiratory movements are rendered more active, and the bronchial secretion is diminished; hence its utility in humid asthma. In very large doses the respiration becomes gasping and convulsive. It is eliminated rapidly by the kidneys, and augments the urinary secretion. It diminishes the secretion of the sweat, and sometimes produces incomplete cutaneous anæsthesia. Its action on the skin in producing a scarlatina form eruption, chiefly affecting the face, is well known, the exanthema disappears after a few hours without desquamation. Speaking generally, it appears at first to excite the vaso-constrictors, in consequence of which there is diminution of the secretions, retinal and cutaneous anæsthesia, and in part, perhaps, dilatation of the pupil. The blood-pressure and the urinary secretion are augmented. In large doses the vaso-motor nerves are paralysed, and insomnia, agitation, and delirium occur. M. Simon frequently prescribes it with success in whooping-cough and other nervous diseases. (*Le Progrès Médical*, June 8.)

Turpentine Vapour Baths in the Treatment of Rheumatism.—Bremont *filis* in a pamphlet on this subject recommends in cases of chronic rheumatic or gouty disease affecting various organs, the employment of baths of the vapour of turpentine, which may be administered by placing the body of the patient in a wooden chest, the head remaining free. Into this chest the vapour of water is conducted, loaded with a fine spray of oil of turpentine. The temperature of this vapour bath is 40–45°C., and the time during which a patient may be exposed to it is about fifteen minutes. (*Centralblatt f. d. med. Wiss.*, No. 8, 1877.)

Treatment of Anæmia and Cachexia by Assimilable Dialysed Remedies.—Dr. V. Baud observes that both iron and arsenic have long been employed in the treatment of anæmia, for their tonic and corroborant properties, whilst the alterative action exerted by iodine has led to its extensive use in diseases proceeding from a scrofulous diathesis. None of these agents are injurious if the doses be carefully prescribed, and their effects watched. As usually administered, however, they are given in what may be called the raw state, and it is doubtful how far they undergo absorption, and whether they may not sometimes do harm by disturbing the digestive functions. Impressed with these views M. Baud set himself to discover a means by which

the drug above mentioned could be combined with some organic substance in small doses, and thus be introduced into the economy in an easily digestible condition. His experiments have led him to employ what he terms diastalised remedies. The general principle of this method consists in combining the mineral substance intimately with a seed, and for this purpose the seed of one of the cruciferae, the cress, is selected, first because it possesses remarkable germinating properties, and secondly because it possesses certain properties that render it specially adapted for the object in view. The seeds about to germinate contain diastase, and in the act of germination a physico-chemical action takes place which is comparable to animal digestion, every part of the seed is reduced to a pulpy state; the ferment developed, however, can by special arrangements be kept in a state of inertia, or quiescence, ready to act as soon as it is placed in favourable conditions. The proceeding he adopts is that the seeds of cress, which are rich in sulphur and phosphorus, are watered with solutions containing definite quantities of iron citrate, potassium iodide, or sodium arseniate. These solutions, far from interfering with germination, render that process more active, and the seeds come to be gradually and thoroughly impregnated with the mineral salt. They are then dried at a low temperature in a stove, and it then contains amylaceous and saccharine principles and diastase. It has lost neither the sulphur nor the phosphorus, but it has acquired new properties owing to the absorption of the special salt employed, the union of which with the proteinous compounds is rendered perfectly certain. It only remains to coat the seed, the form of which is well adapted for the purpose, with some material which will render it fitted for exhibition, and it will be found that a medicine is obtained the activity of which is rendered immediately apparent when the fluids of the stomach have dissolved the saccharine investment. The salt is thus introduced into the system in a partially digested state, rendering it easily assimilable, and hence a smaller dose is required. The diastalised citrate of iron may be prescribed in doses of 5-7 grains, and its acting is shown by the palpitation of the heart, which results from its use. Diastalised potassium iodide given in the same doses advantageously replaces cod-liver oil, for it is in combination with phosphorus and sulphur, which are contained in the oil, whilst the disagreeable flavour of the oil is escaped. Small doses of arsenic can be administered in the same way and have been found very effective, whilst they have no toxic action. (*Le Progrès Médicale*, July 6, 1878.)

Symptoms and Treatment of Nervous Exhaustion.

—Dr. Beard, in an article on this subject, remarks that he some

years ago indicated under this term a functional nervous disease of modern, and largely, though not entirely, of American origin. In the Northern States it is exceedingly frequent, and is nevertheless abandoned to the advertisements of charlatans. He considers it is to be distinguished from simple anæmia, and from hysteria, to which last, however, it often leads. Some of the worst sufferers are full-blooded and fleshy. The symptoms he has noticed in the cases which have fallen under his own observation are tenderness of the scalp which is superficial and peripheral, not deep-seated or central. A frequent tender point is formed over the eyebrow and in the left temple; tenderness of the spine; general or local itching, without any visible change in the appearance of the skin. Abnormal conditions of the secretion, as deficient sebaceous secretion, excessive sweating, clamminess of the hands, diagnostic of sexual exhaustion, constipation; tenderness of the teeth and gums, and indeed of the body generally, as of the tip of the spine, of the breast, ovaries, stomach, heart, eyes, or skin generally; vague pains, and flying neuralgia, flushing and fidgetiness, tremulous and variable pulse and occasional palpitations; sudden giving way of general or special functions, special idiosyncrasies in regard to food, medicine, and external irritants, sensitiveness to changes in the weather; exhaustion, ticklishness, desire for stimulants and narcotics, insomnia, nervous dyspepsia, partial failure of memory, sexual exhaustion, deficient mental control, mental depression with timidity, disturbances of the nerves and organs of special sense, and local spasms of muscles. The treatment of nervous exhaustion Dr. Beard considers should be of a sedative and tonic character. Electricity in central and general applications with both currents, varied and abundant food, passive exercises, as *massage*, in some cases absolute rest in bed, in others action with moderate exercise, and the judicious use of such remedies as relate to the nerve centres, counter-irritation by very small blisters, or the actual cautery, dry cold to the urethra, through the cooling catheter for the special form known as sexual exhaustion, fats, fish, and phosphates of various kinds; and internally cannabis indica in small doses, combined with the bromides, strychnia with Calabar bean, the preparations of zinc, and arsenic, gelseminum and brom-hydric acid, caffeine, malt and oil; under this system of treatment, with right hygiene, the majority of cases will be relieved if not cured. (*Virginia Medical Monthly*, June, 1878.)

The Use of Carbolic Acid by Subcutaneous Injection in the Treatment of Erysipelas.—Dr. James G. Whitmire, of Metaniora, Ill., states that erysipelas may occur from a variety of causes, such as traumatism, specific or local

influence, and also from general or specific fevers, the origin of which may be found in the sporules of microscopic fungi or germs that find their way into the circulation by means of respiration, food, drink, wounds, &c., thus engendering a portion at least of so-called zymotic diseases. In either case the cause of the local inflammation, though there may be a difference in the grade, is evidently derived from some septic or specific source. It is now a generally conceded fact that in the treatment of erysipelas, medicines of a sustaining character are required to successfully combat the disease, as well as those that antagonize the zymoma. Hence the rationale of the use of the tinct. ferri chloridi in erysipelas; because by its absorption into the circulation it enables the red corpuscles of the blood to carry a greater amount of oxygen to the starving tissues, and the presence of the iron in the blood gives to this fluid a richness, and we might say a tenacity, that probably intercepts the fermentive process that has been previously occasioned by septic influences. Potassic chlorate is considered a valuable remedy in the disease, and this probably on account of the large proportion, 39 per cent., of oxygen carried with it into the circulation for the revivifying of tissues and the facilitating healthy molecular change. Dr. Whitmire makes some suggestions regarding the physiological action of carbolic acid when used as a subcutaneous injection in erysipelas. His formula is: carbolic acid in crystals 1 ounce avoirdupois, pure glycerine fld. ℥j., mix and warm in a water bath till the acid is dissolved. To prepare this fluid for the purpose of injection he uses the following proportions: glycerine ℥ss., water ℥ss. of the mixture described above, drops xx. There are therefore about ten drops of the pure acid to each fluid ounce of the mixture, or injection fluid, and therefore one and a quarter drops to each drachm of the fluid. The point of the syringe is introduced at a dozen or more points completely encircling the discoloured skin and at a half-dozen or more points over the diseased surface; after which to keep the surface moist he used a solution of iodine in castor-oil, the formula for which is iodine gr. xv. iod. pot., gr. x., alcohol ℥ij., rub thoroughly in a Wedgewood mortar, add gradually castor-oil ℥iv. till the iodine is all dissolved. In a few minutes is formed a fine red solution of iodine. This solution is preferable lest a stronger one produce an irritating or vesicant effect upon the skin, which would rather favour the spread of the local affection than otherwise. The following prescription is to be taken internally: R tinct. ferri chlorid., f. ℥ss. pot. chlor. ℥ij., ammoniæ hydrochlo. ℥ij., syrup simp. ad. f. ℥iv.; of this mixture one tablespoonful is to be taken in water every four hours. Dr. Whitmire also orders: R opii pulv. gr. iij. quin. sulph. ℥ss. pot. chlor. ℥j.; M. Div in pulv. ix—Sig.:

One to be taken between each dose of the mixture. The thirty cases in which Dr. Whitmire has used this remedy successfully should be, he thinks, sufficient to recommend it to the favourable consideration of the profession. (*The Chicago Medical Journal and Examiner*, March, 1878.)

Amyl Nitrite as a Cardial Stimulant.—Dr. James L. Minor, of Rapidan, Va., states that little need be said in regard to the action of amyl nitrite upon the heart, for frequent experiments have proved beyond dispute the vigorous action of that drug upon the centre of circulation—yet experiments may prove interesting, although they may simply illustrate an established doctrine. A patient who had locomotor ataxia of some years' duration was suddenly taken while under Dr. Minor's charge, from a condition of usual health to that of impending death. There was the hippocratic expression well marked; general pallor, with complete unconsciousness. Respiration was stertorous and irregular. Arterial beat imperceptible at the radial pulse, but faintly recognised at the femoral pulse. The pupils were insensible to light and somewhat dilated. The extremities and exposed parts of the body became cold and clammy. It was decided that nitrite of amyl should be tried, but with no idea of permanent relief, for the patient was too evidently fast approaching his end. The ordinary method of inhaling a few drops from a piece of muslin was adopted; no effect being produced, recourse was had to a hypodermic syringe, with which three minims were injected. In a few moments the heart responded, as evinced by the appearance of a more natural hue of the cutaneous surface. The pulse was recognised in the radial artery. Respiration became much better, and the temperature felt normal. The effect of the medicine seemed to pass off in about half an hour, when the drug was again administered—this time giving five minims hypodermically. The action was similar in kind, but more vigorous in character than the former dose. The pulse became almost as strong as normal. The patient lasted for nearly twenty-four hours, during which time amyl nitrite was frequently given. As much as fifteen minims were given hypodermically at one of the doses, when the pulse became incompressible. So long as the vital powers were able to respond, the administration of the medicine was followed by reaction which seemed marvellous. This proves the powerful action of amyl nitrite, and the beneficial result which might follow its administration in certain cases calling for prompt cardiac stimulation. (*Virginia Medical Monthly*, March, 1878.)

Nitrite of Amyl in Ague.—Dr. W. E. Saunders of Indore calls attention to the value of nitrite of amyl in ague, and records

a number of cases in which advantage has been derived from its use. The drug itself, he remarks, is inexpensive and goes a long way. He now uses nitrite of amyl mixed with an equal part of oil of coriander, to render it less volatile, and at the same time to cover its odour. He regards it as the most powerful diaphoretic he has seen, and he uses it in all cases of fever to produce diaphoresis. The following is one of his cases:—Mr. T. C. came for treatment about 7 P.M. in the cold stage of ague. Two minims of nitrite of amyl were administered; sweating came on in seven minutes. He lay down for half an hour to get cool, and then walked home well. He next morning took a dose of quinine, and has had but one attack of fever without the cold stage since. Previous to this he had fever every day for one month, during which he took large doses of quinine. Dr. Saunders observes that he does not mean to say that quinine should not be used in these cases, for there is ample proof that it tends to check the return of the attacks, and removes to some extent the septic condition of the blood induced by the malarial poison, and this more especially if small doses of opium be combined with it. In no case did the amyl fail to remove the attack in about one-third the usual time, and in most cases the fever did not return. The method of administration he adopts is this: Four drops of the mixture or two drops of amyl are poured on a small piece of lint, which is given into the hands of the patient, and he is told to inhale it freely. He soon becomes flushed, and both his pulse and respiration are much accelerated, and when he feels warm all over the inhalation is discontinued, as the symptoms continue to increase for some time afterwards. A profuse perspiration now sets in, which speedily ends the attack; in some cases, however, the cold stage merely passed off without any hot or sweating stage. (*Indian Medical Gazette*, No. 39.)

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* * Any of the foreign works may be procured on application to Messrs. DULAU, of Soho Square, W.C. ; WILLIAMS and NORGATE, of Henrietta Street, Covent Garden, W.C. ; or BALLIÈRE, of King William Street, Charing Cross.

Department of Public Health.

SANITARY FUNDAMENTALS.

(*Two Lectures Delivered at the Royal Naval College.*)

BY J. NETTEN RADCLIFFE.

LECTURE II.

THE FUNDAMENTAL PRINCIPLE OF SANITARY METHOD.

MR. PRESIDENT AND GENTLEMEN,—

IN my previous lecture¹ I endeavoured to set forth the fundamental principle of sanitary method, namely, *the discrimination of disease*, and in attempting to convey this lesson, influenced in the first instance by associations connected with this building, I described the hygienic history of the Crimean War, not only as this concerned our forces engaged in that war, but also as it affected the progress of hygiene in this country. I attempted to show, with such clearness as was practicable for me within the space of a single lecture, that this principle was a natural outcome of the events of the war so far as these affected hygiene. I have now to make known to you the manner in which the recognition of this principle affects hygienic practice, and I have to illustrate the influence which the method developed from it has exercised upon hygienic work since the Crimean War.

Let me, however, clear up here a possible misapprehension which might arise out of the compression of my previous lecture. It must not be understood that the fundamental principle of

¹ See *Practitioner*, August, 1878.

hygienic method was a discovery of the period at which the Crimean War occurred. Such was not the case; but it was at this period, under the circumstances I have described and in which the Crimean War had the share I have stated, that this principle began to be clearly recognised by others than medical men and to govern in a definite manner the progress of hygiene. When in 1837 the first general legislative measure for the Registration of Births, Deaths, and Marriages was passed, the provisions of the measure in respect to the registration of the causes of death were regarded as specially designed for the promotion of medical science; but the FOUNDER of scientific hygiene in this country, WILLIAM FARR, in his first letter to the Registrar-General, pointed out that every advancement in medicine must tend to the prevention of disease; that the registration of the causes of death is calculated to exercise a more direct influence on public health; and that the "first step" to the prevention of diseases is the discovery of their exciting causes. It followed from this view of this subject that the gain to hygiene from the registration of the causes of death would be strictly proportionate to the discrimination of diseases.

The passing of the Registration Act of 1836-37 rendered systematic hygiene for the first time possible in England; and the earliest important use to which the general registration of the causes of death was applied, in relation to public hygiene, was in the inquiry instituted in 1839 by the Poor Law Commissioners concerning the Sanitary Condition of the Labouring Population of Great Britain. This inquiry had its origin in three special inquiries, the subjects of which were quite pertinent to my present observations. The first inquiry, conducted by Dr. Neil Arnott and Dr. James Philip Kay (afterwards Sir James P. Kay Shuttleworth, Bart.), related to the "Prevalence of certain Causes of Fever in the Metropolis;" the second, conducted by Dr. Southwood Smith, to "Some of the Physical Causes of Sickness and Mortality to which the Poor are peculiarly exposed, and which are capable of removal by Sanitary Regulations exemplified in the present condition of the Bethnal Green and Whitechapel Districts;" the third inquiry, also conducted by Dr. Southwood Smith, "On the Prevalence of Fever in Twenty Metropolitan Unions or Parishes during the year ended the

20th March, 1838." In consequence of the disclosures of these inquiries as to the great extent to which certain physical causes of diseases existed among the labouring classes of the metropolis, an inquiry was directed to be made as to the extent to which like causes prevailed in other parts of the kingdom. This great inquiry, starting from a medical standpoint, was conducted by the Assistant Poor Law Commissioners, by correspondence with the Poor Law Guardians and their medical officers, and by the aid of special reports contributed by many medical men and others in various parts of the kingdom. The vast mass of information brought together from these different sources dealt not only with the question of the physical causes of disease, but also with the question of the remedial measures required for the improvement of the sanitary condition of the labouring population, and, indeed, the population generally. The then Secretary of the Poor Law Board, Mr. Edwin Chadwick, who had taken a part in the inquiry and personally inspected many localities, was instructed to make a general report on the results of the inquiry, and for this purpose the accumulated information was put into his hands. The memorable report he prepared "On the Sanitary Condition of the Labouring Population of Great Britain (1842)" presented for the first time a comprehensive account of the sanitary needs of the kingdom and of the remedial measures required. This report was the starting-point of the subsequent general measures of public health legislation, especially of the Public Health and Nuisances' Removal and Diseases' Prevention Acts, 1848. But if it initiated modern legislation on the subject, it initiated also that tendency of official sanitary administration, general and local, to fall away from the guidance of medicine in respect to disease which I described in my previous lecture. The following extract from Mr. Chadwick's report illustrates this point, and has peculiar interest in view of the subjects of that lecture and of the present lecture. He writes (p. 148): "The medical controversy as to the causes of fever—as to whether it is caused by filth and vitiated atmosphere, or whether the state of the atmosphere is a predisposing cause to the reception of the fever, or the means of propagating that disease, which has really some other superior, independent, or specific cause, *does not appear to*

be one that for practical purposes need be considered, except that its effect is prejudicial in diverting attention from the practical means of prevention." At the moment when these words were written the medical profession was in the throes of that controversy as to the causes of fever which resulted in the discrimination of typhoid from typhus, which made clear the true principle of sanitary method, and for the first time made known the proper mode of using the means at our disposal for the prevention of fevers, substituting an intelligent procedure for a haphazard practice. Add to the foregoing considerations that the legal doctrine of "Nuisance" in relation to sanitary matters, from the passing of the first Nuisances Removal Act in 1848, has invariably included a defined injury to health, and I need not say more to prove to you that the determination of disease, and necessarily its discrimination, has lain at the root of all recent hygienic progress, although not always recognised.

The discrimination of typhoid from typhus, touching as it did the class of diseases which had the most prominent place in the public mind in respect to sanitary measures, made doubt no longer possible as to the fundamental principle of sanitary method and equally of sanitary practice. I do not mean to imply that until this truth had been made so obvious as it was then good sanitary work had not been done; far from it. My own remembrances take me back to the state of things which existed sanitarily in the kingdom when Mr. Chadwick's report of 1842 was published, and I could not well express my admiration without seeming exaggeration of language of the great work done by the pioneers of public hygiene in redeeming the kingdom from the gross sanitary negligence which was then common everywhere. But it is not the less a duty to direct attention to a false direction given early to that work, partly from an eager and generous desire to remedy with least delay too obvious evils, partly from a belief in the sufficiency of the main principles of sanitary work then accepted, partly from a notion that measures, although medical in their inception, were independent of medical knowledge in their execution, largely from a misapprehension of the conditions under which medical knowledge has to be acquired. Not that for a moment I would claim any exclusive knowledge for my own profession.

I freely concede that every one is born a doctor. But there are doctors and doctors; and when the sanitary interests of communities at least are at stake, it is desirable that there should be some sort of guarantee as to the sort of medical knowledge brought to bear upon them. Sanitary quackery and medical quackery stand on a par as to mischievousness.

To return to my theme: The fundamental principle of sanitary method being the discrimination of disease, it follows that *the fundamental principle of sanitary practice is the discrimination of conditions under which disease prevails.* As a corollary, *a knowledge of these conditions is necessary to an intelligent adaptation of remedial measures.* Thus stated, both the principle and the corollary might be read as truisms. The fact, however, is far otherwise.

The more familiar procedures of practical hygiene may be summed up in the one word "*cleanliness.*" They are directed to secure cleanliness of air, cleanliness of water, cleanliness of soil, cleanliness of house, of habits, of personal surroundings. The word is at the same time a necessity and a bane. It is one of those words which, in its relations to hygiene, as Bacon said, "still manifestly force the understanding, throw everything into confusion, and lead mankind into vain and innumerable controversies and fallacies" (*Novum Organon*, Aph. 43). When, in 1842, referring to the discussion as to the causes of fever which I have mentioned, and of a particular opinion adverse to the conclusion that "fever" may be generated in gaols, Mr. Chadwick wrote:—"Taking the controversy at this point, and admitting the force of this statement, the decision will not alter the *practical value of cleanliness* or of its protective effects in prevention, whether it remove an original or only a predisposing cause,"—he unwittingly uttered a fallacy which exercised and still exercises the most mischievous influence on sanitary work. He had in view, as I read his words, common cleanliness—personal, household, municipal—of which the neglect, inexpressibly gross at the time he wrote, masked the more exact notions of cleanliness—technical cleanliness, so to speak—which, as we now know, is of the essence of disease prevention. Common cleanliness is unquestionably the foundation of the more advanced technical cleanliness, and of all the virtues of ordinary

every-day life it is, in my experience, the rarest. Of the several domestic virtues none is perhaps more susceptible of indoctrination by systematic training, but intelligent common cleanliness is, so far as my knowledge extends, an exceptional phenomenon. Even professed hygienists are too apt to forget that hygieia is the deified representative of housewifery as well as of health. When I meet any person possessed of an adequate conception of common cleanliness, I am constrained to regard him with veneration, and to look upon the possession as the result of an inborn genius to be ranked with the higher evidences of intellectual genius. I fully sympathise with a respected hospital matron who, when speaking to me of one of these geniuses who had come under her observation, attributed to him *clairvoyance*. "Sir," she said, "nothing, however minute, escapes him; *I am convinced that he sees round corners and through walls.*" To treat hygienic measures as measures of common cleanliness is to ensure, as a rule, their miscarriage. The common cleanliness of the sailor is one thing, of the soldier another, and of the civilian still another. Under the conditions of the sailor's life, as exhibited in the Royal Navy, the virtue is cultivated to a high degree, and it sticks to the possessor wherever he may be. Under the conditions of the soldier's life it is also highly cultivated in respect to person and immediate belongings, but not in regard to the common sanitary requirements of habitations. But under the ordinary conditions of civil life common cleanliness has an undefined meaning, and it may be entirely undeveloped as among large numbers of the people inhabiting the back-slums of our towns, in numerous colliery villages, and in not a few agricultural districts; or it may have such development as is still to be observed among many communities, especially in the north of the kingdom, where rich and poor live amidst their accumulated filth, banked up with it like the early rhubarb, or the delicate asparagus in gardens, or dainty mushrooms in cellars; or, again, as is to be witnessed in many country seats and palatial residences in the kingdom, where the house, viewed sanitarily, is the more or less artistically designed and luxuriantly appointed shrine of an hereditary and honoured (shall I say venerated?) cess-pit. Now the cleanliness at which hygienic measures aim, if it is to be other

than a delusion, must be founded on an intelligent appreciation of that aim; and such appreciation involves a knowledge of the conditions under which the diseases to be affected by the measures exist. This knowledge is in no intelligible sense common at the present day, even as regards the relations of the most ordinary filth to disease; and to relegate sanitary matters to "common (notions of) cleanliness" and to "common sense," is to relegate them to general ignorance and to general slovenliness. The time will no doubt come when it will be possible for all intelligent persons who will it to acquire such knowledge of hygienic principles and practice as may fit them for dealing deductively with broad hygienic questions, and when the essentials of these truths shall become part of the "common sense" of the people. To this end from the very beginning my own profession, having first awakened the public to a lively sense of the natural importance of these truths, has unswervingly directed its efforts. It is scarcely fifty years ago since these efforts began to produce the results of which we now witness the remarkable development in public-health legislation having run considerably in advance of the public-health education of the community generally. While the question of the primary education of the people at large was still unsettled it would have been idle to anticipate a general diffusion of hygienic education. Indeed, it is only six years ago, when the Public Health Act, 1872, was passed, creating sanitary authorities throughout the kingdom, and requiring the appointment of medical officers of health in every sanitary district, that such diffusion became possible. Nevertheless it has very generally been assumed that the common sanitary sense of the kingdom is sufficiently developed to admit of persons being entrusted with the responsible detailed execution of the Public Health Act who have been taken promiscuously from the people, irrespective of their previous training, in some cases practically illiterate, in many without any preceding acquaintance with the subject, in all devoid of a technical acquaintance with it; these persons, moreover, being as a rule subjected to no skilled supervision. Thus it has happened, indeed, that the beneficent legislation of 1872 has been frustrated in detail over a great portion of the kingdom. The time has not yet come when public health

administration can free itself without disaster from the leading-strings of science; and when the immature bantling, growing tetchy with its nurse, wilfully endeavours to free itself from her guidance, it must fall prone.

Let me endeavour now to convey to you a definite conception of the operation of the two fundamental principles of hygiene I have laid down, the discrimination of disease and the discrimination of the conditions under which disease exists, in hygienic practice, and at the same time to indicate to you the actual position of hygiene in reference to the prevention of diseases.

Beginning with the two diseases of which the discrimination was especially referred to in my previous lecture, I will ask your attention first to *typhoid*. And let me request you to note carefully at the outset that the starting-point of all that follows with respect to this disease was the *accurate distinguishing of the malady*. This is, indeed, the starting-point of all true sanitary method. The disease being distinguished, it was presently recognised from a study of individual cases that it occurred in very definite relation to local states of filth, not to all sorts of filth indiscriminately, but particularly to excremental filth. Soon, however, it became apparent that these cases were apt to occur in groups, and that the cases forming these groups had definite chronological relations to each other, and not unfrequently to a particular case, the first in order of the group. Now it had been ascertained that the disease followed a special order of development, and that in common with general diseases of its class a period probably intervened between hurtful exposure to the conditions under which it was observed, and the manifestation of the symptoms. It was quickly discovered in fact, with regard to these groups of cases, that an average interval of fourteen days intervened between the initial case and the next succeeding case or cases, or between the next succeeding case or cases and their exposure to the excremental filth voided by the first case. Instances quickly multiplied of this sort of chronological relationship between the cases which left no doubt that the relationship was an actual one, and that exposure to the excremental filth of the sick of the disease especially conduced to its development in the healthy.

But the grouping was not always in the same fashion. It was observed in successive groups of two or three, or in a rapidly occurring succession of cases, or in a larger group, of which the individual cases sickened virtually simultaneously. And these various groupings corresponded with exposure to the emanations from the excremental filth of the sick in privies frequented by two or more families, or to the emanations through an unexhausted variety of outlets from an imperfect drain or sewer common to several houses, or to the mingling of the filth in many ways with the drinking-water—such mingling, for instance, as happened at Terling in Essex (as described by my colleague Dr. Thorne Thorne) when a sudden rise of sub-soil water flushed into the wells excremental matters, partly ordinary, partly from the sick of typhoid, with which a peculiarly porous soil was sodden, and following thereupon, within a period of two months 300 persons out of a population of 900 were attacked with typhoid, and 41 of the number died: or as happened at Guildford, (as described by my colleague Dr. Buchanan), when within thirty-three days 254 cases of typhoid occurred, 150 within a fortnight following upon the distribution to the families in which they lived of a particular supply of water into which excremental filth chanced at the time to be leaking from an imperfect sewer: or as happened at Caius College, Cambridge (as also described by Dr. Buchanan), where a misplaced automatic valve-tap admitted of excremental filth and sewer air from a sewer containing the excremental filth of sick from typhoid being sucked up through a “weeping-pipe” attached to a water-closet, and so taken into a branch water-supply, among the users of which presently occurred several cases of typhoid: or as happened at Sherborne, in Dorset, where, typhoid being prevalent in the town, a sudden outburst of the disease was traced by my colleague Dr. Blaxall, R.N., with a probability amounting for practical purposes to a certainty, to a sucking up into the common water supply, in consequence of an improper water-closet arrangement, of air from the sewers, and of excrement from the water-closet basins—a mode of pollution of a general water-supply then for the first time discovered: or as happened at Croydon (as described by Dr. Buchanan), where a diminution of pressure in the water-supply pipes

admitted, in certain circumstances, of excremental matters soaking from leaky sewers into the soil being drawn into the pipes and distributed with the supply.

The antecedent condition of the development of typhoid in the several circumstances mentioned was the breathing or swallowing of excremental filth.

But a grouping of cases analogous to the grouping observed when the filth is swallowed in the drinking-water has been ascertained to be dependent at times on the filth being ingested with the milk supplied for domestic use. This important discovery was first made by Dr. Taylor, of Penrith, in 1858, and afterwards as a rediscovery, so to speak, by my colleague, Dr. Ballard, in 1870; and it is now known that outbreaks of typhoid are not infrequently determined in this manner. I cannot, probably, give a more interesting and instructive illustration of sanitary method than by a description of one of these outbreaks.

During the months of July and August, 1873, a remarkable localised outbreak of typhoid occurred in the west of the metropolis. It was confined, with one exception, to the parish of Marylebone and adjoining parts of the parishes of Paddington and St. George's, Hanover Square; and, with five exceptions, members of well-to-do families were alone affected. Some of the earlier cases of the outbreak, as it chanced, took place in the family of a medical man (Dr. Murchison, himself the principal living authority on the subject of the continued fevers of this country) under circumstances that precluded any suspicion that the disease could have been produced by drainage defects in the house, or by excrementally polluted water, or by exposure outside the house to conditions favourable to the development of the malady. The suspicion followed that the milk used in the family might have been the determining cause, and it was inferred that if this were the case other families obtaining milk from the same source would probably be suffering in the same way. An inquiry made in conjunction with Dr. Whitmore, the Medical Officer of Health for Marylebone, quickly disclosed the fact that of twenty-eight families in the neighbourhood of Dr. Murchison's dwelling who obtained their milk from the same dairy, not less than twenty-six had at the

time one or more of the members laid up with typhoid. The distribution of these cases rendered it in the highest degree improbable that they could have been determined by any common defect of sewerage; and they were situated within the districts of two different water-companies in such fashion that excremental pollution of the general or of a branch supply was out of the question. On the other hand, the number of children affected by the disease, the milk-consumers in especial, was proportionately very great; in the instance of adults affected large use of milk was a notable fact; in the streets where the disease appeared the malady picked out, as it were, the homes supplied with milk from the particular dairy; and in certain families, in more than one instance, the disease picked out the members who drank the suspected milk, and those only. Further, there was some reason to suspect, assuming that the milk issued from this dairy was concerned in the production of the outbreak, that it was not the general milk supply, but a particular sort of milk known as "nursery-milk." From an examination of the operations of the dairy in question, it was next ascertained that this dairy derived its supplies from seven farms situated six in Oxfordshire and one in Bucks, and that from the mode of dealing with the milk it was not necessary to suppose that the supply from more than one farm need be implicated in the mischief. On turning to the Registrar-General's Quarterly Returns it was now found that three of the farms were situated in a registration sub-district which must have been the scene of a serious outbreak of typhoid, extending over two quarters, and which might still be in progress. It was inferred that, *if the assumption of the milk of the dairy being concerned in the production of the outbreak were correct, typhoid or its potential cause would be to be looked for in one or other of these farms.* An inspection of the several farms presently showed that no suspicion attached to the milk sent from six of them, but at the seventh farm a state of things was found which supplied a sufficient explanation of the outbreak. This farm alone was situated in the part of the area of the registration sub-district in which typhoid had been prevalent and was then actually present; it was the farm from which the whole of the "nursery-milk" of the inculpatd dairy

was derived; the occupier had died from typhoid fever a short time before—at a date, in fact, *within the period inferred that typhoid or its potential cause would probably be found to have been present on one or other of the farms if the inference on which the investigation proceeded were accurate*; and the water of the well used for dairy purposes when the outbreak in the metropolis began was discovered to have been exposed to fouling by the excremental discharges of the patient.

This result was the issue of the first investigation of the conditions of the outbreak made under pressure of the urgent practical necessities of the case; and I would have you note how surely a just discrimination of the conditions under which typhoid prevails led to the discovery of the source. The outbreak, the immediate practical necessity being met, was afterwards subjected to an elaborate examination by my colleague Mr. W. H. Power, and the results of the preliminary investigation confirmed in every essential point.

Observe now of this brief account of the conditions under which typhoid prevails the numerous points of discrimination involved in it, each touching a question of practice. First, there is the primary discrimination of the relations of the disease to excremental filth; and then following upon this the secondary discriminations of the various modes in which that filth exercises its hurtful effects. It is simple matter of experience that measures for the prevention of typhoid are successful only in proportion as they are founded upon a clear knowledge of these secondary discriminations. No generally conceived measure for dealing with excremental filth so as to obviate typhoid has yet been found practicable. The earlier plans of sewerage and drainage, devised before the discrimination of the disease, had too commonly the effect, while obviating much nuisance and improving in several ways the health of a community, of distributing “fever”—as is now known, typhoid—among them, and even of introducing it into buildings previously free from the disease. Sewerage and drainage constructed so that they shall not become a source of ill-health have only become possible as successive medical investigations have disclosed the numerous secondary conditions of the development of typhoid, and he would be a rash man who should aver that

even in respect to these special measures our knowledge of these secondary conditions is complete. It is possible now to lay down rules for sewerage and drainage which shall *avoid all the discriminated dangers* from typhoid in this relation, *but not more*. Yet even these rules (which may be read at large in the official memorandum of the Local Government Board on Main Sewerage and Water Supply, prepared by Mr. Robert Rawlinson, and in the Model Bye-laws as to New Houses issued by that Board) have obtained as yet but very partial recognition among the sanitary authorities, the engineers, the architects, and the builders of this country.

Typhoid lends itself readily for the purpose of illustrating the principle of the discrimination of conditions in sanitary practice from the too familiar part which it plays in every-day life, from the definiteness with which the principal conditions of its prevalence have been made out, and from the large influence which it has exercised upon the structural arrangements of works of sewerage and drainage. But typhoid is but one of several diseases which have more or less definite relations with excremental filth. The conditions of prevalence of malignant cholera when present in this country have the closest affinity with those of enteric fever. Much diarrhoeal disease is governed by similar conditions. But in reality medicine has barely crossed the threshold in the discriminative study of the conditions such as I have illustrated from typhoid, and such as I might equally well have illustrated from malignant cholera, and perhaps also the diarrhoeal disease referred to. Little conception can be formed by outsiders of the complexity of such study. Thirty years—the clue once obtained—barely sufficed for the discrimination of typhoid, and twenty years for the discrimination of the principle conditions of its prevalence, as we at present know them. Now the experimental work of the pathological laboratory is coming to the help of the bed-side work of the physician, and we are beginning to find the clue to other relations, and certain probable far-reaching consequences of excremental filth; and not of this filth alone, but of domestic and municipal filth generally, in the production of disease. We are beginning to see our way to a discrimination of the particular modes in which filth operates in the determination of

erysipelas, the fatal fever of child-bed, and the equally fatal surgical affections which still harass our hospitals ; and although the light at present is no greater than the distant glimmer which enabled Sinbad to escape from the interior of the mountain of the dead, we already have assurance that it is sufficient, as in his case, to guide us, if patiently followed, to the full day. Nay, more, we are beginning to see a way in which this filth is probably exercising a potent influence in determining the prevalence of the most fatal and disabling class of diseases of this country, namely, the tubercular, including phthisis and its allied disorders. These tubercular diseases, although causing manifestly over 70,000 deaths annually, have hardly yet come in any defined way within the practical scope of preventive medicine. Generally they have been regarded as indications of degenerative changes affecting one generation of people after another, and which were unlikely to be influenced preventively, except indirectly, through the general hygienic measures in process of being carried out in the country. It is true that in respect to phthisis it has long been discriminated that its prevalence, as the prevalence of other lung diseases, was markedly influenced by certain in-door occupations ; and to the extent to which the circumstances under which these occupations have been improved hygienically phthisis may be said to have come within the range of sanitary practice. But this condition of prevalence so partially met public-health requirements relative to the disease, that phthisis had never been included even by the most enthusiastic hygienist among preventable diseases. But the great discovery made independently by my colleague Dr. Buchanan, in this country, and by Dr. Bowditch in Massachusetts, that (to use Mr. John Simon's words) "dampness of soil is an important cause of phthisis to the population living upon the soil," opened out a wider and more definite prospect of dealing preventively with this disease. And now, should it eventually be proved, as seems probable, that certain septic changes in common domestic filth exercise an active influence in determining the disease, it needs little power of forecast to be certain, especially in view of the pathological views now entertained of the nature and mode and progress of phthisis, that the several conditions under which it exists will sooner or later be as clearly discriminated as in

respect to typhoid, and phthisis brought definitely within the range of preventable diseases.

The lesson that the discrimination of the conditions under which disease prevails is the fundamental principle of sanitary practice is taught equally by *typhus* as by *typhoid*. Obviously the measures requisite for the prevention of typhus, the disease of over-crowding and destitution, differ radically from those for the prevention of typhoid, the disease of excremental filth. The common lodging-houses were aforetime the chief foster-beds of typhus in this country. Then the wretched ill-fed occupants were to be found huddled together promiscuously under conditions of squalor, personal foulness, and in an atmosphere laden with the effluvia from their bodies and breathing. "Crowd-poisoning," to use an expressive phrase, was here habitual, and typhus was also habitual. But when common lodging-houses were put under police-regulation, the number of their occupants fixed, and certain rules as to ventilation enforced, typhus vanished from them, and they have maintained their immunity even with typhus among the population outside. The disease still haunts certain localities of some of our towns; but the complete control exercised over its original foster-bed, the common lodging-house, and an improved administration of poor-relief, together with an improving local sanitary administration suffice to hold it in check, and most probably will continue to do so, even in face of commercial disaster, as was proved during the cotton famine and during the recent collier strikes in South Wales. Here then there is another illustration how the discrimination of the conditions under which disease prevails lies at the foundation of true sanitary practice. Poor-law administration—you will observe—appears in this illustration in the light of a great sanitary agency, and indeed the Central Administrative Destitution Authority and the Central Administrative Sanitary Authority are now one—the Local Government Board. I could have wished to have dwelt upon certain states of privation as conditions of disease, and further to have shown you, *apropos* of the communicability of typhus from the sick to the healthy, how necessary it is to discriminate the several conditions under which communicability is effected in the communicable diseases if we would limit effectually the diffusion

of these diseases. But the time to which I am restricted for this lecture is hastening to a close. I do not know that a multiplication of illustrations would strengthen or make clearer the lesson I have sought to convey by those given. The presence of several Chinese students induces me, however, to give one more, the latest, as it comes to us chiefly from experiences lately gathered in China.

There are certain tropical diseases affecting the kidney (chyluria), and the skin, peculiar tumors, ulcerations, and forms of elephantoid disease, which have hitherto been a despair to medical men. It has now been shown that these diseases, in some certainly, in others probably, are dependent upon a thread-like parasite in the blood. The discovery of this parasite has opened out a new field of pathological discovery in the East, and it has been suggested that the tropical big-leg (the elephant leg, the elephantiasis of the Arabs), and even the elephantiasis of the Greeks (true leprosy) may be dependent upon this parasite. Now the parasite, which by the way has been named *filaria sanguinis hominis*, or *filaria Bancrofti* (after the gentleman, an Australian physician, Dr. Bancroft, who first discovered it in such fashion as to make the knowledge generally available) does not in like fashion as others of its kind, reproduce itself in its human host. He serves simply as the soil for its growth. It had been suspected early after discovery of the parasite, from what was known of certain other thread-like parasites infesting the dog, that the ovum of the *filaria sanguinis hominis* was swallowed in the water drunk, that the ovum was hatched in the intestines, and that the miniature worm migrating thence by boring its way through the tissues attained maturity in the blood-stream, and produced the morbid states which are determined by it from sundry mechanical obstructions of the minutest blood-vessels to which its presence gave rise. But where, when, and how did the mature parasite breed and bring forth? This problem has just been solved by Dr. Patrick Manson, of Amoy, who has contributed very largely to our knowledge of the subject, and who finds Amoy a fertile field for observation. He announces that the breeding-place of the parasite is in the musquito, and that this insect is the medium of its diffusion. The musquito, he has discovered, when fixing upon a person having the parasite in his blood, sucks up the

parasite with the blood. The parasite thus taken into the stomach of the insect undergoes there its final development and brings forth its eggs. These are voided by the insect in the pools it frequents, and when the water from these pools chance to be used for drinking by the population, the ova are apt to be swallowed by them and undergo those changes in the human race which I have described. Sir Joseph Fayrer, M.D., K.C.B., has said of the discovery of this parasite, with regard especially to tropical diseases, that "it will give a new direction to inquiry in regard to many questions of causation and prevention of disease;" and that not improbably it will furnish the clue "to a considerable proportion of morbid conditions — cachexia, nervous diseases, dysenteric and other affections, hitherto vaguely referred to malaria, but now, perhaps, to receive a new explanation."¹ But be the fate of this latter prevision what it may, it must be obvious that the discovery of the *filaria sanguinis hominis*—its discrimination for the first time makes possible a true hygiene of the diseases produced by the parasite.

And here, Mr. President and Gentlemen, I end. I proposed in effect when completing my previous lecture to justify the course I had taken in dealing with my subject. If, as I maintain, the fundamental principles of sanitary method and practice are respectively the *discrimination of disease and the discrimination of the conditions under which disease prevails*, these are essentially medical questions. Mark, I do not say essentially a medical man's questions. The distinction is not unimportant. The medical man, as at present trained, is, with few exceptions, trained to meet the requirements of medical and surgical practice, not of hygienic practice. It is to the discredit of my profession, and a fertile source of confusion, that the Legislature has gone in advance of it. For while the Public Health Act, 1875, provides that every registered practitioner may become a medical officer of health, the medical educational bodies have not taken the necessary measures to ensure that every registered medical man shall be qualified for the post. Not the less, however, is the medical man at present, as a rule, the only person who is qualified by previous education to apprehend

¹ *The Lancet*, March 16, 1878, p. 376.

justly and deal practically with the medical aspects and fundamental propositions of hygiene. Between the capacity to master with the ability to cultivate a special class of knowledge, and the actual acquisition of that knowledge, there is, however, an unluckily interval eminently favourable to the development of the proverbial differences of doctors. I freely confess that much of the confusion of the public mind is owing to differences thus arising. But the confusion becomes still worse confounded when the wholly unskilled set themselves to solve questions which the partially skilled do not regard with unanimity. There is, however, another and even graver source of confusion. The public have not as yet disabused themselves of the old-time notion that the doctor is a man of pills and potions, of bandages and amputating knives; the doctor as a sanitary practitioner is a conception which scarcely exists in the greater part of the kingdom. The larger number of medical officers of health are, in fact, employed as sanitary apothecaries, so to speak, not as health-officers in any just sense of the word. That is to say, they are summoned, by their authority or by the inspector of nuisances, to deal with and prescribe sanitarily for diseases when present, just as the apothecary is summoned and required to prescribe medically for disease. The function of prevention and of determining when preventive intervention is necessary, *is almost wholly entrusted to unskilled agency.*

It is a necessity, and if it were otherwise it would be desirable, that in the ordinary affairs of civil life, in the army, and in the navy, the responsible *administration* of sanitary matters should *not* rest with the medical man. But it is still not sufficiently recognised that sanitary administration, whether on ship-board, among troops, or in municipal life, must be largely futile and often mischievous if not carried out with due regard to medical knowledge. It is the proper function of the medical man upon whom sanitary duties devolve to supply such knowledge to the administration, either in initiating, guiding, or supervising the measures it may have to undertake. Wherever this conception of the medical man's sanitary functions has not been recognised, then failure of sanitary administration, sometimes disastrous, has been inevitable. This was the lesson of the sanitary events of the Crimean War which I related to you; this

was the lesson of the like events of the last Arctic Expedition—a lesson all the more incisive because the present Director-General of the Navy Medical Department, Sir Alexander Armstrong, K.C.B., who had himself drafted the medical and sanitary instructions for the Expedition, had exceptional knowledge of the subject on which he advised, as was widely known from his work entitled “Observations on Naval Hygiene and Scurvy;” this, again, is the lesson we are now being taught on a vast scale in the frustration of the Sanitary Law over a large portion of the kingdom: but, finally, this I venture to say will *not* be the lesson repeated, if, as would seem probable it will be the unhappiness of Great Britain to have again to send her fleets and her armies to the East. The hygienic triumphs of the China Campaign (1860), of the Expedition to Canada (1862), of the Abyssinian Campaign (1867-68), and of the recent Ashantee War (1873-74), will hardly be foregone in another war in the East, even if the memories of 1854-55-56 which would meet the forces in the Dardanelles and at Scutari, would not suffice to prevent so great a disgrace. Yet how hard the lesson is to learn may be gathered from recent events at Netley. The Netley Medical School was the *clinch* of the hygienic regeneration of the army; but on the death of the first incumbent of the chair of hygiene, the lamented Professor Parkes, the question of abolishing the chair was seriously entertained. The founding of a chair of naval hygiene there, and the appointment to it of Professor Macdonald, M.D., F.R.S., was universally regarded by those who had technical experience of the subject as a guarantee that the present high standard of sanitary administration in Her Majesty’s ships should not only be maintained, but that it should be heightened progressively with the growth of hygienic knowledge, but it is rumoured that the stability of the chair is not yet ensured.

Gentlemen, doctors are no doubt queer folk, often apparently crotchety, and at times difficult to deal with; but I would ask you, in the responsible duties you have before you, to consider the aspect in which they appear when they are regarded from this health-point of view. Look upon them as men who have to apply a progressive and rapidly-growing science, of infinite complexity, in which conclusions cannot be tested, and experience

has to be substituted for experiment, and probabilities not always high have to be applied to the prevention of disease and the relief of suffering. Look upon them as men endeavouring conscientiously to use the most complex and immature of all the sciences, but a science which none the less cannot be postponed in its application to sickness and injury until it becomes mature, and you will find in the great majority of cases that the "crotchet" expresses the reasonable doubt of men not professing inspiration, and the difficulty of management the anxious desire of men wishful to exercise their complicated task in a manner which if it will not benefit will not be productive of injury. I ask this consideration in the interests of yourselves and your men. On the surgical side my warning may be less needed; on the medical side it is surely wanted. Remember that the disabled from sickness have no honour, and should have especially your sympathy. There is some mental consolation to the sufferer who has been struck down by shot or shell, or ghastly incision of cold steel; and in the event of his death family grief is largely tempered by pride in the honourable circumstances under which it happened. We regret but we glory in our dead killed in the Crimea; and we admire the maimed veterans of that war. But the unlucky man who has been crippled by rheumatism or other vulgar ailment has no sympathy. Who would twine laurels about a crippled joint or around lumbago-racked loins? I speak feelingly on this subject. The Crimean war was at an end and the army returned home. I came with the rest, a limp from an ankle slightly damaged with rheumatism giving, as I flattered myself, an interesting indication of one fresh from the seat of war. I reached my home in a northern village late at night, and the next morning I turned out early to receive the anticipated congratulations of friends. Hardly had I taken a dozen limps in the main street before I recognised on the opposite side the equivalent of the village squire. The recognition was mutual, and he hastened towards me with hands outstretched and loudly exclaiming, "How glad I am to see you! How delighted your mother must be to have you safe back again! But you are limping! What is the matter? *Hurr you got corns?*"

Such is the glory of rheumatism!

THE PRACTITIONER.

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Original Communications.

THE TREATMENT OF EARLY PHTHISIS.

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(Continued from p. 189.)

ATTENTION to the stomach and bowels, or, as our predecessors used to say, the *primæ viæ*, is essential, and scarcely of secondary importance to the treatment of night-sweats. It may be heterodox to say this in the present worship of physical signs, but it may be said truthfully enough—that with phthisical patients it is more important to study the tongue than to go over the chest with the stethoscope. The latter may doubtless tell the extent of the disease, and so demonstrate the physician's skill in diagnosis: but the other affects the patient; and attention to it may save a life, and neglect of it lose one. When the tongue is covered with a thick fur, it is useless, or nearly so, to give iron and cod-liver oil; for the tongue is the indicator of the state of the intestinal canal, and absorption through the thick layer of dead epithelium cells is well-nigh impossible. It is well here to give a compound calomel and colocynth pill every second night, and to prescribe a mixture of nitro-hydrochloric acid, or phosphoric acid with infusion of cinchona, three times a day, till the

tongue cleans. Or at other times the tongue is raw, bare, and denuded of epithelium. Here it is of cardinal importance to put the patient on a mixture of bismuth with an alkali, and a milk dietary. Often milk and seltzer-water will agree where milk alone is too heavy and too constipating. As long as the tongue is raw it is necessary to fight the case on this line; attending to the night-sweats of course, but not attempting to give hæmatics or oil.

Then comes the matter of attention to all drains, such as diarrhœa. The phthysical are readily depressed by diarrhœa, and it should always be attended to energetically. Of course in the later stages, where the intestines are the seat of tuberculous ulceration, the diarrhœa is very intractable, requiring the free exhibition of bismuth and opium, and even of ipecacuanha, which seems to be of service in such cases. But in the early stages it will yield to a pill of sulphate of copper (half a grain) and extract of opium (one grain). Rice-water as a beverage is indicated where there is a tendency to diarrhœa, and beef-tea should be avoided. Beef-tea often sets up or keeps up a loose action of the bowels. Still more important is it to attend to all drains when the patient is a woman. The neglect of this matter is simply appalling. I have known a woman kept in our most famous hospital for six weeks for a trifling piece of mischief at the tip of one lung, and an attack of hæmoptysis of no great severity, while she was profusely unwell seven out of fourteen days; but it had never struck the physician to inquire into that form of hæmorrhage. The woman was drained by menorrhagia and leucorrhœa, but these had never even been asked after. Another patient was some months in the Brompton Hospital for pleural thickening of the left apex, where a similar state of matters existed with ovarian congestion. It is needless to say that in neither case did any improvement result from the stay in hospital. Three years ago, when going over the National Hospital for Consumption at Ventnor, I asked as to how far any systematic inquiry was made into the drains of female patients, and found that no such inquiry was then practised. In ordinary hospitals no arrangements are made, or place provided where women may retire for the purpose of practising vaginal injections or the use of the bidet: to my mind a very

reprehensible omission. In many menorrhagic women it is more successful practice to limit the loss of blood at the catamenial period than it is to build up the blood during the intermenstrual interval. As to leucorrhœa, it is a dead loss to the system from every point of view, especially mischievous in the phthisical.

For the purpose of vaginal injection, the glass syringe is now abandoned for the well-known Higginson's syringe, or even the ordinary enema ball and pipe, which can be used even with young girls without any injury to them. Where it is essential to build up the organism in every way, as it is in phthisis, all drains and loss, all body expenditure, to use the language of Hermann, must be attended to with scrupulous care. If not, progress will not be made satisfactorily. I remember well a strumous woman with ulceration of the glands of the neck, which persisted in an indolent condition and without any attempt at healing for months, when at last the admission of leucorrhœa was wrung from the patient, who had hitherto denied the fact; and attention to this drain was immediately followed by rapid improvement and repair. This matter is too commonly one of the neglected points in the treatment of phthisis.

Then all inter-current disease or accident, as cold, should be attended to assiduously. A cold may send a further inflammatory storm over the injured lung, and add to the already existing amount of disease, which is eminently undesirable. Not rarely the result is an attack of hæmoptysis, which relieves the lung and lessens the local congestion. This brings us to the question of hæmoptysis, and its significance and treatment.

We all know that fatal hæmoptysis is a not uncommon end of a case of phthisis. On the other hand, hæmoptysis is often one of the best forms of local bleeding, giving great relief to all symptoms,—recovery setting in from that hour; as is well exemplified in a lady under my care at present, where acute lung symptoms have occurred every July for the four last years (in 1876 the condition seemed utterly hopeless). Each time a more or less profuse hæmoptysis has been followed by immediate relief; the worse the condition the more profuse the hæmorrhage, the loss in 1876 being considerable. When the stage of softening has been reached, then hæmoptysis becomes grave.

The ulceration round the softening mass may cut open a pulmonary vessel, and so lead to fatal hæmorrhage. But commonly the vessel becomes an impervious cord (Rokitanski) in the vicinity of the softened mass and the resultant cavity, and so this danger is avoided. Then it is found that fatal hæmoptysis is not rarely the result of an aneurism of a pulmonary vessel; the wall of the vessel being unsupported by lung tissue with its elastic pressure, yields, and a tiny aneurism forms in the cavity; this may be ruptured by any effort, as a cough, and uncontrollable hæmorrhage may result. But these are advanced or chronic cases. In early phthisis, before any softening or cheesy degeneration has been set up, hæmoptysis has a far less grave significance. It relieves the local congestion, and so saves the lung from further implication. It is as useful as leeches near a phlegmon, and in these cases of early phthisis is distinctly beneficial. As a matter of clinical experience slight hæmoptysis in early apical consolidation is usually associated with constipation, and is relieved by acting on the bowels. Consequently when a hospital patient's mixture contains some sulphate of magnesia, as is very commonly the case, and they cease attending, and so are without their medicine, they are found to return with an account of some hæmoptysis which alarms them. It is usually at once relieved by resuming the mixture. Purgation by sulphate of magnesia will often avert a threatening attack of hæmoptysis; especially in those subject to recurrent attacks, and who are familiar with the prodromata of the hæmorrhage. But to be efficient it must be free and copious; mere opening the bowels is not sufficient where the hæmorrhage itself is also free and copious. Where the hæmoptysis is associated with cold hands and feet, and the contraction of the vessels of the systemic circulation leads to a higher blood-pressure in the lesser or pulmonary circulation, and to hæmoptysis consequent thereupon, it is my practice to put the patient to bed with hot bottles to the extremities, and hot fluids to drink; so as to dilate the systemic vessels generally, and so relieve the pulmonary congestion. Just as in menorrhagia with cold legs and feet, dilating the blood-vessels of the lower extremities by heat relieves the pelvic congestion, and lessens the uterine loss. The significance of hæmoptysis depends on its causal relationships; and its true

treatment is founded on a correct appreciation of its concomitants and associations.

Blistering the walls of the thorax is a subject which is still unsettled as regards its value. Many practitioners think very highly of it; others attach little importance to it. In some cases it seems to do good, and it certainly attracts the attention of the patient, and sometimes distracts it, in a desirable manner. When the pleura is involved, and there are sharp pleuritic pains, blistering seems certainly indicated, and does good. As to strapping the chest, as advocated by Dr. Fred. Roberts, this is very useful where the lower portion of the lung is involved; but where the disease is distinctly apical, it is a very difficult matter to apply the strapping in such a manner as will put that portion of the lung at rest.

The effects of mechanical irritants upon the diseased lungs are not usually sufficiently appraised. The tiny particles which float in the air become appreciable matters in the finest bronchiæ and the alveoli of the lung. We know that there are dust-diseases of the lungs, as masons', grinders', potters', millers' asthma, with indurative changes in the lung; the same lung-change is set up in flax-dressing, in feather-dressing, in shoddy-mills, where rags are torn to pieces, in wool-sorters' disease, &c. The impression is strong in my mind that many cases of incipient phtlisis which have with them apparently no great prognostic gravity, go down hill mainly in consequence of the air the patient must breathe being laden with mechanical irritants. The advantages of a sea-voyage, a residence at the sea-side or in the country, are due as much to the fact that the injured lung is not irritated by particles respired along with the air, as to the beneficial effect of improving the general health.

Then there are hygienic and dietetic matters to be considered. A good large bedroom, so that the air can be thoroughly renewed without draught, is very desirable. The ventilation should be efficient, so that perfect oxygenation of the blood and tissues may be secured. With the poor and their small bedrooms with probably more than one occupant, efficient ventilation without draught is practically unattainable; and too frequently they cannot even have their windows open on account of the noise around them, or even of stench. When

long hours can be spent in the open air this imperfect night oxygenation—the storing up of oxygen in the tissues as pointed out by Voit—is less injurious than when the day is spent in close rooms.

Then as to the diet. It must be nutritious, and easily assimilable. It should consist of meat-juice in any form, milk and farinaceous foods, and especially the different foods prepared for infants, which are mainly starch partially digested. If solid food can be taken well, very good, and a certain amount may be taken daily. Londoners seem to think that mutton is the food for all invalids, from the phthisical to the dyspeptic. Where there is a tendency to diarrhœa it is well to avoid beef-tea, and to resort to a milk dietary. Where the digestive powers are low, meat-juice or raw meat pounded may be digested where starchy foods are not assimilated. But my own opinion is that farinaceous foods are not so objectionable as some would make out, if proper care be taken to see that they are taken as they should be. Thus beef-tea, which alone is scarcely a food, becomes nutritious if biscuit-powder, fine oatmeal, or baked flour under any name, be added to it. This is better than thickening with isinglass, or gelatine. Then if there be diarrhœa, it is well to make rice-water and use it to dilute the preserved milk, instead of plain hot water. Attention to these trifles may constitute the turning-point of a case. Then milk puddings, stewed fruit and cream, especially where there is any tendency to constipation—or those cakes of oatmeal and treacle sold by Scotch bakers and confectioners, which are a very pleasant laxative food, may be eaten with advantage. It is well that the patient should sleep after the noontide meal; this aids digestion and cuts the weary day in two—no slight matter, especially when the days are long. Then when the digestive powers are feeble, and the patient cannot fast long, it is well to have a glass of milk through the night; or a glass of that excellent old-fashioned remedy, rum and milk, early in the morning; this breaks the fast, and often procures the patient some refreshing sleep ere getting-up time comes. With many, the glass of rum and milk enables them to relish the breakfast when it arrives, where otherwise the long fast would do away with all appetite. The breakfast should consist of coffee, or

cocoa, with some good milk, an egg, or a little bacon ; and the bread should be cut thin, and the butter rubbed well in. It is well to finish the breakfast with fruit, an omission in English practice that should not exist. A glass of milk, or a biscuit betwixt breakfast and lunch or early dinner, is indicated in some cases, where the patient cannot go long without food ; but the too common practice of having a glass of wine at eleven o'clock has no vindication in most cases. Alcohol may be taken with food to aid the digestion, and a glass of sound wine or good malt liquor, at lunch and at supper, is often of service ; but the constant sipping of alcohol is bad, and the port-wine treatment of phthisis is unjustifiable, where it is not a hollow mockery and the wine a vile adulteration. A glass of really good port wine at meals suits some invalids better than any other sort of alcohol. Alcohol should be taken as an adjunct to other food—not as a substitute for it. Of course, in the final stages alcohol is sometimes the only food that the patient can take ; but it is a well-known fact they do not live long on it.

Such are the lines to be pursued in the treatment of early phthisis. Some intercurrent matters and side issues may now be briefly considered. The first is cough. Where a patient is one of several in a hospital ward it may be necessary for the sake of the others to give the patient a quiet night, as well as desirable for him, or herself. But opiates have drawbacks, and should be combined with other agents, as stated in the commencement of this article. The question of the use of an opiate linctus, “to be taken when the cough is troublesome,” is one on which opinions may differ. My own opinion is dead against it: I have seen the most disastrous consequences follow—loss of appetite, constipation, further loss of flesh, &c. To my patients the advice given is—that it is better to put up with cough ; that the “something for the cough” will do more harm than good, and that they are better without it. Some take the advice ; others transfer their professional confidence to some physician who holds a different opinion about “cough-medicines”: anyhow I do not see much of the slow poisoning (often not so very slow) of phthisical patients by opiate linctus now, having seen quite enough of it. Then there are those abominations called “cough lozenges,” which are just as bad as the linctus. I do

not dogmatically assert that these things never do good; but the harm done to most cases far counterbalances the good done to the few. If a medical man is called in to see a perfect stranger suffering from a racking cough, he is probably justified in prescribing a sedative cough mixture at first to give relief, and so gain the patient's confidence; but the systematic use of such medicine is too frequently immoral and unjustifiable. As to the use of "cough lozenges" Dr. Mitchell Bruce's view is a sound one; he gives the morphia and ipecacuan lozenge, finding from experience that the ipecacuan generally nauseates the patient before enough of morphia has been taken to do much harm. Where the cough is very troublesome, bromide of potassium may be given as affecting reflex action favourably with a minimum of bad after-effects. The most pleasant means of relieving cough, that is useless and harassing, is hydrobromic acid, with spirits of chloroform three or four times a day; it is effective as well as palatable. Chloral is not a drug to be advocated in cough.

Where there is a history of syphilis two important new features are lent to the case. Prognostically its gravity is greatly lessened; and it is easily amenable to treatment, that is, to specific treatment, the solution of the perchloride of mercury in free quantities, together with some tincture of steel to counteract the hæmolytic effects of the mercury.

Whenever the patient's skin is greasy, with pallor accompanying this oleaginous skin, then the case is as gloomy as it well can be.

When the stomach and digestive organs are put right, it is well to give iron with strychnia as a tonic (especially where the respiration is involved), or, at times, arsenic. It is well to add a pinch of sulphate of magnesia to each dose. At other times iodide of iron pills are indicated. The tonic treatment should be continued till the convalescence is thoroughly established. When the cod-liver oil disagrees, it is well to withdraw it for a while, and then to start again with a small dose. It rarely does good unless the tongue is clean.

Finally, two little matters are worth attending to. The first applies to hospital patients about their dietary. They are often very ignorant, and it is well to have printed slips, with the

preparation of a few simple articles of food upon them. This saves time in giving directions, and prevents mistakes from the patients' confusion and forgetfulness. The second applies to the erratic action of belladonna at times. It is not desirable to allude to the dry throat and disturbance of vision as toxic effects; it is better to say "if the pill at night makes the throat dry or affects the eyesight, don't be alarmed: it shows that the medicine is taking hold."

ON TWO CASES OF PARALYSIS, CHIEFLY SPINAL.¹

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THE following paper contains the histories of two cases of motor paralysis resembling each other a good deal in many respects—their situation, their extent, their functional character—but differing in the most important *qua* therapy, viz., in their causation. In the first no direct cause is apparent, all that we can determine is that the paralysis succeeded a condition of motor hyper-excitability, or clonic spasm. In the second the cause appeared to be gastric irritation, as on its removal the paralysis rapidly disappeared. The one may be designated an instance of paralysis from simple *failure* of nerve force, the other as an example of *arrest* of nerve force (Hemming paralysis, or inhibitory). The knowledge of the existence of these two kinds of paralysis is of great practical value.

CASE 1.—CHOREA WITH PARALYSIS.

A. E. W., female, æt. 7, admitted January 16th, 1878.—Has been ailing ten days. Has lost flesh lately, used to be very stout. Had measles three years ago, and again since Christmas. Has no worms. She can't speak as usual; can't walk at all, her legs are so unsteady; can't feed herself. Complained of her head a good deal before the chorea came on. Does not sleep well. Bowels have been rather confined. Appetite pretty good. Half ord. diet. The next day having had a few doses of chloral, she was if anything worse; it was difficult to feed her. Her face was red and her arms about the elbows.

¹ A clinical lecture delivered at St. Mary's Hospital.

She was ordered Ferris' solution of hyoseyamine ℥i. + aqua ʒi. t. d. This was gradually increased to six doses a day on the 24th, when she was much quieter, but very powerless; two days later she lay quite helpless, scarce able to move her limbs, and quite unable to sit up without aid; when she was raised up some jactitations occurred. She was ordered sodæ hypophosphitis, gr. ij. + Vini Ferri ℥. v. + aq. ʒij. *quater die*.

On the 31st she seemed to be improving, there was no murmur at the precordia.

Feb. 4th. Great difficulty in speaking, or moving limbs; she can hardly be induced to make an effort to touch my finger with hers; when she does try it is after much solicitation, and with a great effort, as if she could not get her volition to bear on the motor centres.

On Feb. 7th she began liq. arsenicalis, ℥ij. t. d., and ether spray to the spine, with the addition, on the 11th, of a tepid salt-water plunge-bath each morning.

14th. Cannot sit up in bed; if raised falls helplessly about from muscular weakness.

On the 18th she was nothing better, swallowed even worse; dose of liq. arsenicalis had been increased to ℥ 3 and ℥ 4. She was ordered argenti nitratis, gr. $\frac{1}{6}$ + acid. nitrici fortis, ℥ $\frac{1}{2}$ + aq. D. ʒij. t. d.

25th. Is decidedly quieter, swallows better, but is crying now as her mother is with her. Is very emaciated. Port wine 3 oz., beef jelly.

March 2nd. Smiling and placid, but powerless; has no power to move her arms at all, or to sit up in bed, or even to hold her head up. Motor power seems quite lost. Tickling the soles of her feet produces very slight movements of the toes, but nothing more. Takes her food well, enjoys her wine. No murmur at heart. Strychniæ, gr. $\frac{1}{16}$ + acid. nitr. dil. ℥ 2 + spt. chlorf. ℥ 8 + aq. ʒij. t. d.

March 4th. After being quite silent for several days, not even saying yes or no, she said "nurse" this morning. Passes all evacuations under her as she has from the first. Cannot move her hand. Smiling and cheerful.

11th. Taking four doses of the mixture daily. Both arms when raised fall utterly inert, she lies perfectly still when I

tempt her with the offer of a penny to touch my finger, but she speaks more, and is gaining flesh. Never makes known her wants to evacuate.

18th. Can talk fairly well now, and always asks for the bed-pan. Urine pale, clear, neutral, sp. gr. = 1,008.

21st. Is improving fast, can raise her hands a good deal, can touch my index-finger pretty well with her right, but not with her left; can sit up in bed.

23rd. Talks now more than any of the other children, and is very merry. Seems to have noticed everything that was going on while she was so voiceless and paretic, as she knows the names of every one in the ward. Cannot put a cup of liquid to her lips yet.

25th. Can touch the tip of my index-finger with her left to-day, but is quite unable to stand without help; has but little command over her legs, and is frightened if she attempts to stand.

28th. Is running about quite actively. Went out soon after.

Remarks.—That the disease in this child was chorea is not doubtful, but the genesis of the malady is by no means clear. There is not a particle of evidence that it was due to rheumatism. The absence of any endocardial murmur makes embolism very improbable, to say nothing of the counter-evidence against the view generally. The preliminary headache was much more that of debility than of meningitis, which occasionally seems to initiate chorea. The recurrence of measles cannot be taken as of much moment in the pathogeny, except as perhaps an additional cause of debility. Fright, which is often a potent cause of chorea, was not mentioned in the history we had. So then we have to confess—as we often must—our ignorance of the true motor of the disorder. But if we know not the cause, the nature of the derangement is, I think, tolerably clear. There was certainly no cerebral tumour, tubercle, inflammation, toxæmia, or cranial exostosis. Embolism of the arteries we have rejected, though had it existed its results might have been much the same as those actually present. Of remote irritation, such as might have been produced by a tænia or decayed teeth, there was no trace. The disorder was evidently functional, and not organic, and was, I believe, primary. In other words, it consisted in a simple failure of certain cere-

bral nerve cells to evolve sufficient force. This defective nutrition is an accident, so to speak, very similar to that which often befalls females soon after the establishment of puberty. Their blood-cells waste considerably, not from defective supply of nutriment, but from lack of power to appropriate it. The fixed cells of a solid tissue may doubtless suffer in a like way to the floating cells of a fluid. In chorea we have to deal with a state of enfeeblement of the nervous system, which expresses itself, as is its wont, partly by manifestations of hyperexcitability, partly by those of paresis. Usually the former are the more striking; but in the instance I have brought before you, the latter greatly predominated. Not only were the muscles of the limbs and trunk extremely paretic, but those of the tongue and pharynx were in a very similar state. The sphincters were so weakened, that for a long time she passed all her evacuations under her. Her emotional control was so much weakened that a visit from her mother made her cry. No delirium occurred, nor is there any proof that the intellectual faculties were notably impaired, though this, according to Trousseau, is almost invariably the case. It is difficult to determine whether muscular weakness or mental torpor are most to be blamed for the constant soiling of the bed, or whether moral perversity is not also to be incriminated. I am sure that not rarely bodily infirmity or derangement greatly intensifies the innate tendency to evil. I remember a choreic girl who sorely exercised the patience of one of the best sisters we ever had in Victoria ward. The perverse monkey when taken out of bed at proper times to perform the necessary evacuations would do nothing, but ten minutes after she had been put back to bed, *re infectâ*, afforded conclusive evidence that her cloacæ had not been empty. But leaving these more debatable points, and looking at our case broadly, there is no question that it affords a remarkable instance of *primary functional paralysis*, and as such I ask you to consider it. To my thinking it is a very important point in neuro-pathology that nerve centres can become truly paralysed, without the existence in them of any discoverable lesion, or any incapacity for complete recovery. This point I believe is quite established. Wilks and Hughlings Jackson agree that

patients, even young persons, may die in the same way as those who have cerebral hæmorrhage, and yet at the autopsy no lesion whatever be discovered. Charcot tells us that in patients suffering under multilocular sclerosis, or progressive spinal paralysis, it is by no means rare for attacks to occur suddenly of stupor or profound coma, sometimes with convulsions, sometimes without, attended by hemiplegia, and either entirely disappearing or proving fatal in a day or two. In none of these has he ever found it possible to discover, either in the nervous centres or in the viscera, any recent congestive lesion, oedematous or other, which could explain the grave symptoms that characterised the fatal termination of the disease (vol. i. p. 207—Lectures.) Hemiplegia after epileptic fits is, I think, certainly functional, as it varies very much in its duration, and disappears completely. The same view must be taken of the hemiplegia of child-bearing women, described by Dr. C. Allbutt. He regards it as dependent on the exhaustion of pregnancy and that of suckling. But it may occur without either. Excessive lactation is a recognised cause of extreme nervous prostration, leading—as in a case I lately mentioned—up to melancholia, or, as in another record by Dr. Wace, to amaurosis and complete paralysis of the iris. Dr. R. Reynolds says of the spinal cord, “that it may be exhausted by over-exertion, and both its conductive and reflex functions injured. We meet with incomplete paraplegia from over-walking, climbing, or running; and very often with impotence and weakness of the lower limbs, as the result of over-action of the sexual organs. Romberg relates a case of paraplegia produced by the action of malaria, and exhibiting a marked tertian type. So let it be an article of your medical creed that in conditions tending to impair nerve force you may meet with more or less complete paralysis of some nervous centre, without the occurrence of any dilapidation of structure, and without the too commonly assumed congestion and effusion.

With respect to treatment I have not much to say. All the remedies we tried during the first eight weeks were of little avail, except perhaps the nitrate of silver. The administration of strychnia coincided with recovery, and was, I have no doubt, appropriate. Still I do not doubt that recovery would ulti-

mately have ensued without. Believing as I do entirely that various remedies may be very beneficial in cases of chorea, I also admit that the disorder tends spontaneously to terminate in recovery, although its period of duration varies greatly in different cases. Recoveries, however, may certainly be expedited by treatment, and relapses avoided. Always observe whether the phenomena are more indicative of hyper-excitability or of paresis. If, as is usually the case, the former predominates, you must employ the various sedatives; if the latter, you must have recourse to the tonics.

CASE II. GASTRIC CATARRH PRODUCING PARAPLEGIA.

T. F., æt. thirty-six, admitted April 24th, 1878.—Ill two months, has often pain after food, nausea, and vomiting; once he brought up a little blood. Has much pain in left hypochondrium, some in epigastrium, and in interscapular region; none in the rest of abdomen. Tenderness is very marked in left hypochondrium. All parts of abdomen are resonant except the right hypochondrium; the hepatic dulness extends from fifth rib to three inches below margin of chest. Heart's impulse just within nipple line; sounds normal. Pulse 84, not cordy. Appetite indifferent. Some thirst. Temperature on 24th, 2 P.M., 98·2; on 25th, 97°. The ward sister states that when he first came into the ward he walked very badly, stooping notably. He says that his legs were not at all weak until 24th; on that day as he was coming to hospital along the Edgware Road pain took him just over the eyes like a flash: very soon after his feet began to be numb, with sensations of needles and pins; he could hardly feel that he had legs; his hands also at and near the finger-tips as far as the next knuckles became numb and blue at the same time. The right has now (27th) quite recovered, but the left fingers feel full and stiff, and the hands enlarged. No palsy of sphincters. The legs feel cold and numb with sensations of needles and pins, and he is unable to walk well. He was taking bismuthi trisnitr. gr. x + acidi hydrocy. dil. ℥4 + mistr. mucilg ʒi. t. d., and had had a blister to left side of epigastrium. His diet was broth, beef-tea, milk.

29th. Stomach symptoms lessening, appetite better. Walks fairly well, his feet are warm and sensitive, but the motor power

is defective in both legs, both as regards flexion and extension ; he cannot flex or extend his legs against the resistance of my arm. The right hand, which was all right the other day, is now quite dead (he says), but is warm and sensitive.

May 2nd. Hands are all right now, feet are warm, but are still the seat of dysæsthesia. No tenderness whatever in left hypochondrium, only a little at epigastrium, where another blister has been applied. Appetite good.

6th. Walks quite well now, no pain or tenderness at stomach. Omittr. mistr.

9th. Doing well, has no stomach disorder, hands and feet all right ; if there is any dysæsthesia it is about the ancles. Can quite overcome all the force of my arm opposing his legs in flexion and extension. Grasps strongly. Went out on 10th.

An instance similar to the preceding is related by Mr. Erichsen (v. *Lancet*, 1878, i. 451). In this a lady suspected of disease of the spinal column had become paraplegic during pregnancy. So complete was the paralysis that electric sensibility, irritability (contractility?), and reflex action were all completely extinguished, the lower limbs being as insensible to every stimulus that could be applied to them as those of a dead body. Two opinions were held, one that the paraplegia depended on softening of the cord, and was permanent and incurable ; the other, that it was functional, so-called hysterical, possibly dependent upon anæmia of the cord, and that the patient would recover. The latter view proved correct. Here the starting-point of the irritation was undoubtedly in the uterus.

As far as regards the stomach symptoms, there was nothing unusual in Case II. The first, and doubtless correct view, was that the stomach was primarily affected, and was suffering from ordinary catarrh, with perhaps some ulceration. But the nervous symptoms were very unusual, and puzzled me for a while. I thought at first of a primary cord lesion, with secondary development of gastric or epigastric disorder, the latter having its seat in the abdominal walls, and not in the subjacent viscus. Trousseau refers to such states in his *Clin. Lectures*, vol. ii., p. 311. The Griffins consider that spinal hyperæsthesia may cause actual disorder of internal organs corresponding to the part of the spine affected, *v.* p. 91. In our case no complaint was made of any spinal tenderness, and no treatment was

instituted to remove any. The remedies employed were those which usually avail for the relief of primary gastric disorder, and they proved efficient. As the latter subsided so did the nervous derangements. This may have been a mere coincidence, but I think the probability is quite the other way. There is no novelty in the idea that disorders of the alimentary canal may injuriously affect the great nervous centres, causing severe headache, giddiness, impairment of mental power, or even hemiplegia or unconsciousness, by irritation of the brain. Spinal cord disorders are more rare, but are certainly met with, and this may well have been one of them. Of the reality of the motor paralysis I do not entertain any doubts, although I have only the patient's word for its existence. Had he been a malingerer it is certain he would not have recovered so rapidly as he did, only ten days intervening between his being quite unable to overcome the resistance of my arm and his being well able to do so. A question might be raised as to whether our patient's malady was really multilocular sclerosis of the cord, attended—as occasionally happens—with gastric crises. Some sufferers from this malady have remarkable intermissions in the symptoms, and in most the functions of the bladder and rectum are intact, as in our patient. Still in the absence of any tremor, giddiness, diplopia, nystagmus, slow or drawling speech, the existence of the lesion in question must be considered extremely improbable. Besides, the long duration of the gastric disorder quite takes it out of the range of critical occurrences, which would not outlast a few days. I commend the case to your consideration as illustrating the following points:—(1) The occurrence of a true functional but temporary paralysis. (2) The genesis of this by an irritation acting inhibitorily. (3) The diffusion of the irritation in the cord from the brachial to the lumbar enlargement. (4) The concurrence of vaso-motor spasm with sensory paralysis in the hands and feet, the latter outlasting the former. (5) The distinction which ought to be maintained—but is not always—between *irritation* and *stimulation*; the latter producing beneficial excitement of nervous structure, promoting and arousing functional activity, and the former having the reverse effects, showing themselves as pain or dysæsthesia, spasm, tremor, or paralysis.

THE CLIMATIC TREATMENT OF PULMONARY AND OTHER DISEASES, WITH SPECIAL REFERENCE TO SOUTH AFRICA AND SEA TRAVEL.¹

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(Continued from p. 176.)

NEXT, as to the route, and the particular places towards which to travel. It is probably best to make for the high country at once, with a view of resting there for some time. If you dislike the sea, buy your requisites in Cape Town, send them on to the present terminus of the railway (now somewhere beyond Matjesfontein), meet them there, and "trek" up through the Great Karroo to Beaufort West, Graaf Reynet, Colesberg, and so into the Free State to Bloemfontein. There is an alternative northern route, that will take you *via* the Diamond Fields, and also a southern route through George and the Knysna to Port Elizabeth. If, however, the sea is not objectionable, go by steamer to Port Elizabeth, take advantage of the railway as far as it is made, either towards Graaf Reynet or Graham's Town, and then get away northward. There are many places, as to climate, quite as good as Bloemfontein, both in the Orange Free State and elsewhere. But the latter is a good geographical as well as a climatic centre, and, as I indicated before, the kind and hospitable attention accorded to visitors gives an especial charm to the quiet capital of this little republic. If any trouble or difficulty arise in a town or village through which

¹ A portion of the matter contained in this paper appeared in the *Lancet*, May, 1878.

you are passing, it is best to seek the advice of the Civil Commissioner or Landrost, from whom you will obtain all necessary information and advice combined with much courtesy.

The actual extent of journey must, of course, be guided by circumstances of health, time, weather, and other considerations. The rainy season varies in the eastern and western districts, so it is necessary to be clear on this point, and regulate your movements accordingly. If a stay of eighteen months or two years is contemplated, it is better, as "up country" arrangements are at present, to stay quietly in what we may call the "home" districts until, say, March, and then commence the journeying. The Diamond Fields should, of course, be visited, for the climate there is as healthy, and the manners and customs of the inhabitants are now quiet enough; and, moreover, there is something to see, and much that is well worth seeing. If (as I am assuming) you have your own belongings, the Transvaal is, to my mind, the pleasantest of all the South African provinces about which to wander, and it ought speedily to attract pulmonary patients. The climate is lovely, fruit, eggs, and milk are abundant, water plentiful, and sport, I believe, fairly good. Wakkerstroom, an isolated, and forlorn-looking village towards the east, impressed me much with the wonderfully invigorating quality of its air, and on taking the altitude, I found it 6,000 feet above the sea-level, the maximum height scored during my journey. Both Heidelberg and Newcastle are good sanitary centres, better probably than either Pretoria or Potchefstroom, the two chief towns, now rapidly increasing.

I have appended to these brief notes some thermometrical and other tables, for which I am indebted to the kindness of the persons whose names appear upon them. I have purposely made them merely abstracts, because it is not necessary to do more than give a general idea of the average temperature in various parts of the country. The altitudes of all the chief towns were taken by an aneroid, tested at the Cape Town Observatory before and after the journey. But these notes are written, not to dispute the very excellent climatic qualities of this section of the southern hemisphere, but to describe and explain other conditions that must affect directly all who go there—conditions as to which the profession and the public in

England (and even, to a great extent, in Cape Town) appear to be profoundly ignorant.

The establishment of sanatoria is, in so very large a country, the kind of question that requires a great amount of consideration. There are several places in Cape Colony that would, probably, be as climatically good as Bloemfontein, Harrismith, or many villages far north. But none can as yet be properly called accessible, and the disastrous war just concluded will, of course, inevitably delay the extension of railways, the improvement of roads, and many other matters that, under the experienced and energetic supervision of the present Governor, would assist to promote the prosperity of South Africa in every possible way. As to the immediate present, the improvement of hotel and other accommodation about Wynberg (and specially in the neighbourhood of Rathfelder's), at Ceres, and at Graham's Town, would afford a material guarantee to physicians that, as their clients cannot live upon air alone, those sent out may be certain of securing other and material aids to health. From personal observation, as also from the evidence of Messrs. Donald Currie's agents and others at Cape Town, it appears that during the last two years (*i.e.*, since the speed of the steamers has increased, and the weekly service commenced) the number of invalid travellers has increased by at least 40 or 50 per cent.

And there can be little doubt that when the Zulu difficulty is settled they will continue to increase, with benefit to all concerned, if only proper pains are taken to direct the invalid aright after his arrival in this still semi-civilised country. The chief starting-points for the interior are Cape Town, Port Elizabeth, East London, and Durban. Cape Town should always be made a stopping-place for the sake of rest in its charming suburbs, but, as I have said before, the city itself should be avoided as far as possible. From Cape Town excursions may be made to Ceres and many other small places by rail, and if the Diamond Fields land route be chosen, it is the best plan to buy your waggon, &c., at the capital, send them up to the terminus of the railway (somewhere beyond Matjesfontein), and join them there.

If you elect to go round to Port Elizabeth, do not stay at all in that laudably commercial, but very hot and dusty town.

Get away at once to Uitenhage by rail, and after a stay there, make your way (still by rail) towards Graham's Town, which by this time the iron road has probably reached. It is well to make a tolerably long stay here. In going northwards to the Orange Free State, there are two routes from which to choose. That by way of Bedford, Cradock, Middleberg, and Colesberg is the most direct, and is used by the mail-carts. But the roads are very bad indeed, and until the government have time and money to improve them, the alternative route through Fort Beaufort, Queenstown, Dordrecht, and Aliwal North had better be chosen.

The landing at East London is always uncomfortable, almost always difficult, and often dangerous, and it is, in the present state of the roadstead works, quite unfit for invalids. But, this difficulty overcome, and the railway journey to King William's Town accomplished, the high land of Kaffraria is reached very quickly, and this in the future will probably be found one of the best districts in which to establish a sanatorium. But we are anticipating, and our advice at present is to avoid East London as a port of arrival or departure.

Durban is the port of Natal, and is of course made the starting place for the interior, if you desire (a very undesirable thing for invalids) to begin at the eastern end of our South African possessions. However, in visiting Durban as an invalid, or even as a convalescent, the best thing you can do is to make your stay as short as possible. The environs of the town (the Berea, Umgeni River, &c.) are charming, and the kind hospitality of the inhabitants is superlative and almost irresistible. But the air is moist, and so in most cases less suitable for unsound lungs than that of Pietermaritzburg, the capital, and incomparably less health-giving than that found in the hilly districts around Estcourt, Ladysmith, and Colenso.

A word about impedimenta. Unless you are prepared to buy a waggon and horses or oxen at once, reduce your baggage to the smallest possible compass, and buy as you go along at the stores, one or more of which exist at every village. Very light clothing is to be avoided, strength being always an important item, and one of the necessities a suit (including a waterproof) that will really keep out the rain. And remember that if you are at

all in a hurry, or want to travel "haste post haste," it will be better not to go to South Africa at all. In no part of the world (not even in Turkey) is time less valued.

I have attempted in these brief remarks to give some information to those who may, on the score of health, want to go, as well as to those who may desire to send, patients to South Africa. The broad characteristics of the climate are a dry air (very dry in the uplands) and as thermometrical observations show, no great extremes of temperature. The seasons are so well and consistently marked, that, as a rule, comfortable and healthy places may be found in some one of the districts all the year round. As a climate for living in the open air it is, I suppose, almost unrivalled.

As will be seen, I have not attempted to indicate the precise varieties of chronic lung disease that should be sent to this country, or the precise stages of the disease at which it is wise for the physician to recommend the journey, or for the patient to undertake it. The article is intended for lay as well as professional readers (though it has, by the courtesy of the Editor, been admitted into this journal), and we do not prescribe for the public in books. I am compelled, however, once and again to record that too much care cannot be exercised in choosing patients for this somewhat remote change of air. I can also most confidently assert that the climatic advantages of the country have been underrated in an unprecedented degree by patients and their advisers, because the choice of case has not been happily made, and the result has naturally enough been unsatisfactory. And at the same time, in desiring to be just, I have, at the risk of being ungenerous, stated fairly and fully the discomforts to which all travellers are as yet liable. I hope I have not exaggerated them, and believe that they are nearly all remediable.

No. 1.

Meteorological Observations taken at Wynberg, Cape Colony, during the year 1877.

MONTHS.	Height of Barometer.	Dry Bulb Thermometer.	Wet Bulb Thermometer.	Mean of Maximum Readings.	Mean of Minimum Readings.	Absolute Maximum of Month.	On what Days.	Absolute Minimum of Month.	On what Days.	Humidity.	Dew Point.	Tension.	Barometer minus Tension.	Rainfall.	Number of Days on Which Rain fell.	Average Amount of Cloud.
January	70.1	63.8	82.4	60.0	99.9	29th	53.0	6th	69	58.78	.503	in. 29.215	in. 0.280	3	4.3
February	66.8	62.1	80.5	58.5	94.3	28th	51.0	4th & 25th	76	58.26	.495	29.209	1.580	7	4.1
March	67.7	63.5	82.6	58.7	103.0	18th	52.0	28th	77	60.19	.525	29.180	0.580	8	3.8
April	61.9	58.9	75.4	54.2	91.0	18th	41.5	24th	83	56.53	.463	29.290	4.780	10	4.1
May	55.1	52.9	64.0	50.0	75.8	2nd	39.2	29th	86	50.74	.376	29.402	17.930	20	7.0
June	53.6	50.7	65.8	48.9	80.0	10th	41.0	1st	83	47.95	.338	29.617	7.070	10	3.6
July	52.6	50.6	65.9	47.9	79.0	2nd	39.0	28th	87	48.51	.344	29.580	2.590	6	4.5
August	53.9	51.7	66.4	47.7	78.5	23rd	40.0	18th	86	49.49	.356	29.561	6.130	8	5.2
September	57.6	54.0	69.9	49.1	88.3	21st	41.8	15th	80	50.80	.377	29.536	2.470	6	4.5
October	61.3	57.3	75.5	51.5	94.0	5th	42.0	9th	79	53.95	.422	29.393	2.430	5	3.9
November	63.5	59.1	75.9	54.4	96.1	20th	47.8	16th	76	55.58	.450	29.308	2.670	7	4.3
December	65.5	60.5	78.3	55.1	92.0	30th	48.0	3rd	74	56.62	.462	29.292	1.240	6	4.2

WILSON GREATHEAD,

Secretary, Meteorological Committee, Cape of Good Hope.

No. 2.

Extracts from Readings of Thermometer at Green Point, 2½ miles east of Capetown, facing the South Atlantic Ocean. Compiled by the Hon. Sir David Tennant, Speaker of the House of Assembly, Cape Colony.

Taken at 7 a.m. and 7 p.m.

		Fahr. Highest.		Fahr. Lowest.		Fahr. Average.
1872.						
April	...	68° (8 days)	...	60° (1 day)	...	66°
May	...	72° (3 days)	...	48° (2 days)	...	60°
June	...	62° (2 days)	...	40° (2 days)	...	56°
July	...	64° (3 days)	...	52° (3 days)	...	60°
1871.						
April	...	78° (2 days)	...	52° (2 days)	...	64°
May	...	78° (1 day)	...	60° (5 days)	...	64°
June	...	68° (3 days)	...	54° (2 days) S.E.	...	62°
July	...	66° (2 days)	...	47° (1 day) S.E.	...	58°
August	...	66° (1 day)	...	52° (5 days) S.E.	...	60°
September	...	72° (2 days)	...	58° (3 days)	...	66°
1870.						
April	...	70° (1 day)	...	64° (9 days)	...	66°
May	...	67° (1 day)	...	60° (8 days)	...	63°
June	...	72° (2 days)	...	56° (4 days)	...	62°
July	...	68° (4 days)	...	52° (6 days)	...	60°
August	...	70° (1 day)	...	57° (2 days)	...	64°
September	...	67° (3 days)	...	62° (6 days)	...	65°
1869.						
April	...	75° (1 day)	...	60° (2 days)	...	65°
May	...	78° (1 day)	...	57° (2 days)	...	62°
June	...	68° (2 days)	...	54° (1 day)	...	63°
July	...	64° (8 days)	...	58° (10 days)	...	60°
August	...	70° (1 day)	...	54° (1 day)	...	62°
September	...	68° (12 days)	...	57° (2 days)	...	65°
1868.						
April	...	70° (2 days)	...	62° (1 day)	...	65°
May	...	70° (1 day)	...	62° (6 days)	...	64°
June	...	66° (3 days)	...	58° (2 days)	...	62°
July	...	66° (3 days)	...	58° (7 days)	...	61°
August	...	68° (1 day)	...	62° (7 days)	...	64°
September	...	67° (1 day)	...	60° (1 day)	...	63°
1867.						
April	...	72° (5 days)	...	60° (6 days)	...	66°
May	...	64° (10 days)	...	60° (8 days)	...	62°
June	...	62° (2 days)	...	55° (1 day)	...	60°
July	...	68° (3 days)	...	58° (8 days)	...	63°
August	...	67° (1 day)	...	60° (12 days)	...	62°
September	...	68° (2 days)	...	58° (3 days)	...	65°

The prevalent winds are N.W., W., S.W., S.S.W., all from the sea. When the S.E. (a land wind) blows in the winter months, the cold is considerable.

Observations taken at King William's Town during the year 1876, by Dr. Egan, for the Meteorological Committee.

MONTH.	Height of Barometer.	Thermometers.		Mean of Maximum Readings.	Mean of Minimum Readings.	Absolute Maximum.	On what Days.	Absolute Minimum.	On what Days.	Humidity (complete saturation = 100.)	Dew Point.	Tension.	Barometer Reading corrected for Tension.	Rainfall.	Number of Days on which Rain fell.
		Dry Bulb.	Wet Bulb.												
January ...	28.138	69.3	65.3	80.4	54.8	99.0	27th	46.0	21st	79	62.19	.569	27.571	4.470	16
February ...	28.164	66.8	64.3	76.4	54.1	92.0	18th	44.0	24th	86	62.33	.571	27.596	12.230	17
March ...	28.237	64.6	61.7	76.4	50.5	88.0	1st 19th	39.0	17th	86	59.78	.527	27.714	3.250	16
April ...	28.381	60.4	57.9	72.2	49.8	81.0	2nd 16th	39.0	12th 28th	85	55.71	.452	27.922	2.710	10
May ...	28.467	53.2	50.5	65.0	40.0	77.0	14th	27.0	26th	83	47.75	.338	28.139	3.890	10
June ...	28.563	50.6	46.8	62.4	38.0	77.0	5th	28.0	3rd 29th	77	42.98	.280	28.277	0.980	6
July ...	28.592	49.1	44.4	63.3	34.7	74.0	23rd	26.0	18th	70	39.28	.246	28.346	0.320	4
August ...	28.490	51.9	47.5	66.8	35.6	82.0	8th	29.0	4th 13th 19th 30th	74	43.26	.285	28.205	0.420	3
September...	28.425	56.9	54.2	67.9	43.4	82.0	1st	31.0	24th	85	51.96	.396	28.033	2.970	12
October ...	28.375	60.7	56.1	76.0	45.9	99.0	29th	32.0	1st	75	51.90	.398	27.984	0.450	6
November...	28.284	61.1	57.6	74.6	47.5	94.0	21st	37.0	12th 23rd	80	54.51	.436	27.849	4.230	16
December ...	28.175	64.9	59.9	80.9	49.8	93.0	14th	38.0	11th	73	55.78	.455	27.720	1.340	11

No. 4.

Observations taken at Bloemfontein, Orange Free State, by Mr. John Barnet, and Mr. Barlow, Editor of "The Friend of the Free State" Weekly Journal.

1851.	Average Fahr.	1871.	Average Fahr.	1872.	Average Fahr.
May 1	54°	May 1	53°	May 6	56°
" 8	42°	" 17	54°	" 8	54°
" 15	41°	" 21	53°	" 14	50°
" 22	39°	" 24	46°	" 21	55°
" 31	39°	" 25	48°	" 29	50°
Sept. 1	50°	Sept. 3	60°	Aug. 5	48°
" 8	42°	" 10	60°	" 14	45°
" 15	44°	Oct. 15	58°	" 17	40°
" 22	56°				(Indoor temperature.)
" 30	55°				

No. 5.

Observations at Kimberley, Griqualand West. Compiled in 1876, by Dr. Dyer, for the Meteorological Committee, and compared with similar sets of Observations compiled by His Excellency Colonel W. Owen Lanyon, C.M.G., Administrator of the Colony.

MONTHS.	Barometer.	Thermometers.		Mean of Maximum Readings.	Mean of Minimum Readings.	Absolute Maximum of Month.	On what Days.	Absolute minimum of Month.	On what Days.	Humidity (complete saturation = 100).	Dew Point.	Tension.	Barometer Reading corrected for Tension.	Rain Fall.	Number of Days on which Rain fell.
		Dry Bulb.	Wet Bulb.												
January ...	In. 26·024	74·3	67·4	95·1	61·9	108·0	1st	46·6	21st	67	62·19	·566	..	In. 2·120	9
February ...	26·037	72·4	67·3	90·7	60·7	102·0	8th	53·8	4th	74	63·42	·591	..	4·740	15
March ...	26·113	68·6	63·2	87·4	55·3	98·6	6th	39·0	8th	72	59·00	·512	..	2·760	13
April ...	26·188	62·4	58·8	..	51·4	98·0	4th	42·0	25th	81	55·93	·454	..	1·050	8
May ...	26·195	54·1	50·8	74·9	43·2	85·9	5th	34·1	17th	81	47·79	·339	..	0·900	5
June ...	26·268	48·0	45·4	69·1	37·0	81·3	1st	20·0	25th	82	42·71	·274	..	0·970	3
July ...	26·290	49·2	45·8	73·3	37·6	82·0	25th	27·5	6th	80	42·42	·279	..	0·010	1
August ...	26·193	54·9	49·2	79·9	42·1	90·0	23rd	28·0	13th	68	43·94	·292	..	0·240	3
September...	26·118	63·3	54·6	84·2	49·7	95·0	22nd	35·5	29th	57	47·40	·332	..	1·210	3
October ...	26·127	66·5	56·2	82·6	50·8	92·0	{ 5th 30th }	41·0	1st	54	47·94	·345	..	2·300	5
November ...	26·063	66·1	59·3	79·5	51·8	102·0		41·0	11th	67	53·72	·424	..	3·880	8
December ...	26·047	75·9	64·3	93·4	56·9	104·5	14th	46·0	8th	52	55·99	·460	..	1·080	2

No. 6.

*Observations taken at Potchefstroom, Transvaal, in 1876,
by J. Persson, Esq., C.E.*

1876.	Fahr. Max.	Fahr. Min.	1876.	Fahr. Max.	Fahr. Min.	1876.	Fahr. Max.	Fahr. Min.
Feb. 1	31	17	June 15	18	0	July 1	20	2
" 8	28	15	" 22	17	0	" 7	14	-2
" 15	27	19	" 29	12	-2	" 14	17	-2
" 22	25	16	" 30	17	4	" 20	19	-3
" 27	29	16						

No. 7.

*Observations taken at Pretoria, Transvaal, by J. R. Lys, Esq.,
in 1875 and 1876.*

1875.	Fahr. Max.	Fahr. Min.	1876.	Fahr. Max.	Fahr. Min.
Sept.	85	56	Jan.	88	63
Oct.	85	52	Feb.	89	65
Nov.	89	59	Mar.	87	54
Dec.	85	62	April	82	52
			May	81	51
			June	79	40
			July	78	43
			Aug.	85	48
			Sept.	87	51
			Oct.	85	51

No. 8.

*Observations taken at Pietermaritzburg, in 1869, furnished by Messrs.
P. Davies & Sons and the Editor of "The Natal Witness."*

1869.	Fahr. Max.	Fahr. Min.
November	103	45
December	103	50
January	99	57
February	102	56

No. 9.

Observations taken at Durban, Natal, in 1874. Copied from Blue Book of 1875.

1874.	Fahr. Max.	Fahr. Min.
November	87	56
December	87	57
January	89	63
February	89	63

Difference between wet and dry bulb averaged 4 to 5.

Altitudes of towns in South Africa, taken with barometer (Aneroid) at 30° Fahr. sea level.

	Feet.		Feet.
Graham's Town, Cape Colony..	1,760	Potchefstroom, Transvaal	... 4,780
Bedford	... 2,500	Witwater Rand	... 4,930
Cradock	... 3,000	Pretoria	... 4,620
Middleburg	... 4,200	Heidelberg	... 5,400
Colesberg	... 4,700	Standerton	... 5,200
Philippolis, Orange Free State	4,600	Wakkerstroom	... 6,000
Fauresmith	... 4,800	Utrecht	... 4,300
Bethany	... 4,600	Newcastle Natal	... 4,100
Bloemfontein	... 4,750	Colenso	... 3,320
Bethulie (Orange River)	... 4,400	Estcourt	... 3,900
Fountain Valley	... 4,770	Plains. Harding's Store	... 5,200
Thaba 'Nchu	... 5,250	Howick	... 3,700
Kimberley, Griqualand West	4,400	Maritzburg	... 2,600
Pokwanè	... 4,200	Panmure (E. London), Cape Colony	... 200
Christiana, Transvaal...	... 4,250	King William's Town	... 1,370
Bloemhoff	... 4,450		

SYPHILITIC EPILEPSY.

BY THOMAS STRETCH DOWSE, M.D., F.R.C.P.E.,

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IN the present vague nomenclature of nervous affections, and especially of the term which heads this chapter, it is almost impossible to give a clear and intelligible definition of what is now clinically demonstrable to us as epilepsy. But for all practical purposes we are inclined to build up our diagnosis upon that broad though ill-defined basis which has received the sanction and support of most European authorities.

An impaired function, either sensory, motor, or of the two combined, cannot without an impairment of volitional consciousness be called epilepsy. The attributes of mind—thought, memory, and perception—are the essential factors of consciousness and of the conscious Ego. A temporary departure from these states renders the individual, according to the degree and suddenness of the attack, an epileptic, and more or less automatic in his movements.

The subjective signs and symptoms of epilepsy—let them be made up of a simple or compound elementary derangement of the special faculties, sight, smell, hearing, taste, or touch—do not constitute epilepsy, for the reason that they do not interfere with consciousness proper—by this I mean reasoning consciousness. The truism that all mental states have their parallel physical states is well borne out in the varying phases of epilepsy, and a lesion of the spinal cord, or even of the medulla oblongata, below the conjoint reflex cerebral vaso-motor and inhibitory centres of the encephalon, cannot produce any condition which

would fairly be embraced by the term epilepsy. But as we proceed from the medulla as a centre to the convolitional cortex we shall find that an alteration in any part of this nervous mass, interrupting its stability or correlative integrity, will engender an epilepsy.

If experience serves us well, and if we are to understand an epilepsy to be what is here stated, I think we are right in concluding that there is no part of the brain which cannot of itself be the seat from which an epileptiform seizure may be generated. And I would here state as my opinion—that wherever we have a profound epileptic seizure with bilateral convulsive movements of sudden invasion and speedy departure, leaving the patient free to act voluntarily (a condition, by the way, which perverts the normal functional activity of every nerve centre in the body), then we find a true and proper epilepsy, whose seat is the medulla oblongata and pons, and of which all other forms are merely types and gradations. This was the view of Schroeder van der Kolk, and is still held, I believe, by Reynolds, Echverria, Nothnagel, and possibly by the majority of observers.

I do not know of any field of research more replete with interest of the highest order from an anatomical, pathological, physiological, and psychological point of view, than that which has been so carefully and studiously followed out by Dr. Hughlings Jackson and Dr. Wilks, to develop the idea which they alone in this country have promulgated in reference to epilepsy; and did I entirely agree with the doctrine which they expound, I should find little difficulty in drawing up a psychophysiological scale of syphilitic epilepsies, based upon sensory motor phenomena, the result of functional and organic impairment of those highest centres designated the anatomical substrata of consciousness. But judging of epilepsy proper from one anatomical standpoint previously noted, I can only say from what I have seen (and my field of observation has not been a limited one) that syphilitic epilepsy proper is an extremely rare affection as the result of acquired syphilitic disease. On the other hand, believing as I do that syphilis in its hereditary form produces an unstable and defective evolution of the nervous centres to a degree far beyond any other agency, I should hold that primary

idiopathic epilepsies are more due to hereditary syphilis than they are to any other cause, and in treating of epilepsy from acquired syphilis—which we choose to designate as such for convenience' sake—we shall in fact be dealing with the petit mal of Trousseau, and the epileptoid seizures of Hughlings Jackson.

Doubtless in the experience of others the grand mal may have occurred as the result of acquired syphilis ; but, as I have said before, it is unquestionably rare, and is almost invariably associated with gummatous tumours or vascular changes of the pons or medulla. Does a brain epileptic? (subjective epilepsy) constitute an individual epileptic? (objective epilepsy.) I should say not. If it is so, there is no living being that is not an epileptic. Yet this is essentially the theory of some writers upon the subject, who would lead us to understand that every organ of the body having its special attributes or functions—simple, definite, compound, complicated, associated or combined, whether of the purely reflex automatic or of the higher sensorial centres,—any departure therefrom means epilepsy. If this be true the world is one mass of epileptics. The endeavour to draw a plumb-line with mathematical precision between relative psychical and physical states is to try to do what is entirely beyond our power. The attempt in past ages to transmute the baser into the higher metals was an act of equally worthy merit.

Advanced biologists would have us believe that nothing more is required than a master mind to unravel the tangled mass of scientific knowledge and show us that the natural laws of the universe are biological exponents originating, developing, and decaying by a mere process of rule of thumb. The comparative anatomist traces with his scalpel and microscope the gradual developments of textural transformations from the monad to man, and in his "mind's eye" he sees a spontaneity in the evolutionary processes without a break from the purely automatic to the reasoning, the intellectual, and responsible being. Nothing seems clearer than this to his individual reasoning.

In fact the scientific mind has of late years been swamped with pschyco-physiological evidence of the functions of the

brain and nervous system, which, although considered tenable to-day, are to-morrow scattered far and wide, leaving a barren, but still fertile soil for new hypotheses and investigations.

I think I have pretty clearly shown in my writings on the pathology of syphilitic disease of the brain,¹ that in the great majority of cases syphilis attacks the membranes and the surface of the convolutions of the hemispheres. Several typical cases have been given by way of example, so that we shall have no insuperable difficulty to surmount in trying to elucidate certain forms of evidence direct and indirect which will help to lead us to a correct estimate of the nature and causation of the epileptoid paroxysm which has a syphilitic origin.

Some authors have laid particular stress upon the shrill cry which precedes an epileptic seizure in syphilitised persons. This point, in conjunction with others, may be borne in mind, but it will be found of slight relative importance in assisting us to form our diagnosis. M. Fournier, whose lectures on epilepsy at the Louvaine in Paris in 1875 received considerable attention, sums up his views on epilepsy as a symptom of syphilitic cerebral disease in the following manner:—

“1. Absence of the shrill cry which usually announces the outbreak of an epileptiform paroxysm.

“2. Occurrence of paralytic symptoms immediately succeeding the fit.

“3. Incomplete or unilateral character of the paroxysm—thus there may be no loss of consciousness during the seizure, or only one-half of the body may be convulsed, and so on.

“4. The constant occurrence during the intervals between the attacks of cerebral symptoms in some form or other gradually increasing in severity.

“The previous history of the patient, as well as the age at which the disease first manifests itself, furnish most important data regarding the diagnosis, whilst the result of specific treatment should be taken into account.

“Epilepsy showing itself in an adult over thirty years of age, previously in good health, may in nine cases out of ten be looked upon as syphilitic.”

¹ *Medical Press and Circular*, 1877-78.

These deductions might very well have been taken from the clinical history and pathology of cases coming under my own care, and to which I have drawn the attention of the profession.

I would here remark that it is only by the most careful investigation of details that we can ever be in a position to state that an epileptic fit is due to syphilis ; and we must not forget the following expression of Dr. Sieveking in his work on epilepsy, "that several of the diseases which are commonly regarded as residing mainly in the nervous system move into one another, and the boundaries by which they would appear to be circumscribed by nosologists are by no means so uniformly to be traced."

I think it must be clearly understood that acquired syphilis does not predispose a stable brain and nervous system to attacks of epilepsy, petit mal, or epileptoid seizures, unless under two conditions—namely, first from absolute organic change in the nervous substance (vessels included), and secondly where albumenoid syphilis has so impaired the vaso-motor centres and vascular functions of repletion, exchange, and repair that the blood becomes not only attenuated, but loaded with effete products. Perhaps, however, this latter statement is open to question, for on looking over my records of several such cases of genuine epilepsy, I find that the history has been connected with habits of drunkenness and debauchery—thus rendering a stable brain very unstable. On the other hand, I have found in unstable brains and nervous systems where there has been an hereditary predisposition to neuroses and epilepsy that acquired syphilis has in the secondary stages, and for some years subsequently, actually relieved the patient from the epileptogenous tendency which, however, in the later stages of the disease has returned with tenfold virulence. And I would here allude to another cause of epilepsy the result of syphilis. A man meets with an injury to his head from accident more or less severe, and should he be the subject of syphilis, it is quite probable that he will during the inflammatory process suffer from true epilepsy, which had he not been syphilised would not have occurred. I have met with several such cases ; and what is more, the epileptic habit has become confirmed and been transmitted to the offspring. Such as these are points of fact for observation,

and supply undeniable evidence to guide us in our mode of treatment.

We know that idiopathic epilepsy is much more general in infancy, in childhood, at the age of puberty, and in advancing life than it is between twenty-five and forty-five years of age, so that it is only reasonable to infer that, should a man in the prime of life be seized suddenly with epilepsy without any hereditary or predisposing cause save that of syphilis, syphilis should be its origin. When this is the case I always look upon it as one of the gravest and most serious manifestations, and in all probability as merely the exponent, either of commencing, or it may be of advanced, cerebral degeneration which has escaped recognition.

The interference with associated volitional sensori-motor and intellectual co-ordinate processes is always the precursor, either of an epileptoid or epileptic seizure of syphilitic origin. The somnolence of cerebral depression and molecular inertia of the sensorial centres of uræmic epilepsy differs essentially from the sudden collapse of the integrity and stability of the sensori-volitional co-ordinating forces which engender the storm of a true idiopathic epileptic seizure. The exuberance of animal spirits, the high tension which is often found before a seizure in the confirmed epileptic, has not in my own experience existed where the malady has its origin in syphilis, and the epileptic seizures of infancy and youth when carried into old age must be looked upon from an essentially different pathological if not physiological standpoint.

In plain language, then, there is no single intrinsic element or sign, either subjective or objective, in connection with true epileptic seizures which will enable us to say that an attack is due to syphilis. But when our observations are extended to what may be termed the epileptoid series (sensori-motor functional derangements arising chiefly from organic causes), then we have opened to us an illimitable field of investigation.

It would be going over ground previously trodden to treat of the varying signs accompanying cortical degenerations of the convolutions with their attendant mental and physical disturbances, for they have been fully detailed in my published cases on the pathology of syphilis. And in these we find phenomena

which combined can only be considered in the light of cumulative evidence to constitute a type upon which anything like a definite diagnosis can in any possible way be founded.

In the consideration of cerebral epilepsy associated with epileptoid involuntary muscular movements, we are certainly in a position to state with a fair amount of accuracy through our studies of psychology and its bearings upon physiology and pathology whether the condition with which we have to deal arises from the disturbance in the reflex vaso-motor or inhibitory cerebral centres ; or whether, on the other hand, it is due to an intrinsic neurosis, or to some organic change either in the heart, the blood-vessels, the neuroglia, or the nerve-cells.

In enabling us to draw deductions with a fair share of accuracy from a biological calculus so concrete as that of the brain, we must admit that much light has been thrown upon the subject and great aid given by the high-class researches of Dupuy, Hitzig, Brown-Séquard, Charcot, Ferrier, Jackson, Broadbent, Darwin, Huxley, Spencer, Bain, and other labourers in the same field of science ; that much has been done since the writings of Gall and Spurzheim to elucidate more completely certain evolutionary processes and problems of gross motor functional areas ; yet our knowledge of the higher functions of the brain in reference to their exact nature, their origin, and the part they play, is as crude as was that of those observers.

As far as pathological proof goes, there can be little doubt that in the majority of cases epileptoid seizures (whether they are or are not associated with mental defects) are due to convolitional functional irritability resulting from actual organic change.

In true epilepsy the reverse obtains, and the convolitional functions are merely inhibited, not locally, but in most cases suddenly and completely, and the brain cells after the check is withdrawn rapidly regain their normal functional activity. In watching carefully a series of convulsionaries (I use the term to indicate those who are the subjects of any involuntary muscular movements) one is astonished at the varying features to which different conditions of the brain give rise. It is one thing to build up the volitional from the automatic. But it is another thing to see a highly wrought brain, with a human perfectibility

of instructive faculty gradually losing power of thought and will, and those attributes of a reasoning creature, of which man is the archetype of all created beings.

If it were possible for us to build up and destroy at will the several functions even of gross individualities and types of brain species, what a grand unveiling and unravelling would there be, and what eagerness on the part of scientific men to make and complete a work which is now and ever will remain a cosmic biological puzzle. It would be better to continue in our present stage of knowledge than to assume with some wild brains of this nineteenth century that we have all light and all knowledge of a subject so complicated and so profound.

Every thoughtful brain plays a part toward the unravelling of the mystery, but the illimitability of nature will never receive definition from those whose ideas of biology extend no farther than the scientific workshop.

What a discovery, says one, so-and-so has made!—he has found out that there is force in a ray of light ; that the rheophore of a battery applied to definite parts of the brain will cause a monkey to blink, wink, or squint ; to dance, hop, skip, or jump ; to phonate a falsetto, contralto, or basetto ; that a decapitated frog will swim with its head upon its back under certain stimulus ; that the movements of the heart are controlled by the pneumogastric nerve, and that certain mental aberrations, known as melancholia, dementia, delusions, illusions, and so on, can be engendered at will by those drugs which determine vaso-motor action. What advances science is making ! Quite so. The wars even of the elements must soon succumb to the control of man, and nothing will remain for him to do but devise means whereby he can walk upon the seas, float in the atmosphere, and propel himself at will a hundred miles an hour. And even were all this realised, where would man be ? Just as far from the end as ever.

Should any one wish to make himself acquainted with a broad, common-sense, and comprehensive view of the relationship between psychology, physiology, and physical pathology of the brain, he would do well to study the writings of Hughlings Jackson on epilepsy. And not merely to read, but carefully to digest them, for they show an anatomical consideration of the

relation between the physical and metaphysical from a purely clinical aspect, without a knowledge of which, I maintain, reasonings and comparisons upon the great question of cerebral biology are simply abortive, unsound, and unphilosophical.

The question of the existence of subjective epileptoid inherent brain states is made manifest to the physician through compulsory mental agencies. We test for the development of this subjective phenomena with as much accuracy as the mere physicist or medical rubber would test for the calibre or strength of a muscle by the dynamometer or galvanic current to generate a given amount of volitional as distinct from automatic force. A muscle, or group of muscles, when subject to automatic movement, respond purposively as far as the automatism of the spinal centre is concerned. But when volition is brought to bear upon them under certain states of irritability, convulsive movement and tremor defy volitional central controlling power, and we have a "Spinal Epilepsy" as the result; so that I would put it thus :—

Subjective epileptic cerebral states bear the same relationship to mind that volitional muscular movements do to the automation of the spinal cord in the production of spinal epilepsy. Yet, considering the co-relative integrity between the two, we can trace, with a fair amount of precision, the beginning and the ending of either in distinct grades or strata until a profound epileptic sensori-motor fit is engendered. Hence a vague nosology has arisen, and we find the different terms in daily use—as catalepsy, chorea, hysterical epilepsy, hysterical mania, epileptic mania, and so on.

In making a diagnosis as to whether an epilepsy is syphilitic or not, we have first to consider one of the most important divisions of epilepsy, namely, that class of epileptics where the mind between the seizures is unaffected, as we find to have been the case with men of the greatest courage and mental power (Cæsar, Napoleon, Petrarch, Pio Nono, and many others); and the other class where there is more or less mental derangement between the attacks. I am quite convinced that syphilitic epilepsies belong essentially to the latter. The mental disturbances may be of the slightest possible degree, or they may be of a more exalted and definite type.

As we have noticed in writing of "The General Paralysis of the Insane,"¹ we find during the epileptic attacks of syphilised patients that there is for the most part an utter inability to develop the higher mental faculties—to reason, to think, to act with purpose. There is no power to co-ordinate those intellectual processes necessary for the generation of ideas. But this becomes still more apparent when another factor is brought into play, namely, volitional muscular movements of the highest and most complex kind, as in those which are the exponents of articulate language. This is very easily demonstrated by causing the patient to go through a multiplication table. Mind and muscle work co-ordinately up to a certain point, but when volition is brought to bear upon mind, memory is lost, articulation becomes a mere jumble, and we have a temporary state of aphœmic aphasia and agraphia; in fact, an epileptoid seizure. The epileptogenous zone exists within the brain, and not without it.

In such cases as these, which certainly belong to the group of convolucional epilepsies, I have been enabled to induce a seizure at will. But there are other signs of commencing mental disturbance, which are perhaps of greater importance than those just mentioned, for this reason, that they may be easily lost sight of, or not recognised at all. I refer to changes in character and disposition, either slight or profound. As Nothnagel says, "The patients become gloomy, out of humour, depressed, or violent and irritable, nervous, distrustful, easily angered. Or the disposition is changeable often without any appreciable reason."

It is in cases of this nature that our prognosis must be extremely guarded, and the most careful treatment compulsorily enjoined. To make use of the words of Griesinger, "The memory decreases, the imagination grows dull, the fancy loses its richness of colouring, its intensity and warmth, and the spirit becomes withered." Do not let me be understood to infer that all cases such as are here indicated belong essentially to the class of syphilitic epilepsies. I merely go so far as to say that it is from these, and I might almost say from these alone, that we find epilepsy the result of syphilitic constitutional disease, associated with more or less diffuse arterial changes.

¹ *Medical Press and Circular*, 1877-8.

On the other hand, as we know, a definite and distinct neoplasm of syphilitic origin may exist and give rise to epileptoid seizures without interchange of mental disturbance; but this is exceptional. Again, I have seen some few cases of marked syphilitic origin where sensory manifestations appear to have been alone implicated, and where the mind has been quite free between the attacks, and patients have recovered under anti-syphilitic treatment, though during sleep they have been subject to decided epileptic seizures. No writer seems to lay so much stress upon this point as Trousseau. Minor epileptoid seizures may occur during the day, and confirmed seizures take place alone during sleep. I well remember a man who was sent into hospital under my care, said to be suffering from kidney disease, aged forty-three. The urine was highly albuminous, plentiful in quantity and phosphatic, but no signs of organic renal change could be found.

He was pale somewhat, and, as the nurse expressed it, "very strange." His legs and arms bore scars of old syphilitic ulcerations, and he stated that he was syphilised when a young man. One night he got out of bed and deliberately took the poker from the grate, began smashing the windows in the lavatory, and ended by inflicting severe scalp wounds upon several men who tried to restrain him. When he was seized and disarmed he denied having any knowledge of what he had done. The next night he was watched, and almost at the same hour he had a confirmed epileptic seizure, after which he proceeded to go through again the performance of the previous night, but he was of course checked. He denied any knowledge of ever having had a fit of any sort. Prolonged anti-syphilitic treatment cured him. Cases somewhat similar to this could be detailed in numbers.

The following case of sensory abortive epilepsy of apparently syphilitic origin is extremely interesting:—C. A., a man of literary attainments, thirty-three years of age, came under my care for what he termed "strange sensations." He was a highly intellectual man, of temperate habits, but contracted syphilis when young, which he was inclined to think he had never got rid of, but previous to this he had enjoyed excellent health. At the age of twenty-nine he began to suffer from attacks of

headache, vomiting, and a sense of numbness of the entire *right* half of the body, but consciousness was scarcely if at all interfered with, neither was voluntary power. The fit commences with dimness of sight, leading to total blindness of the right eye—diplopia during the seizure, but immediately preceding it there was hemiopia (no retinal change.) There were no formications, but the right half of the tongue became numb, as well as the parts supplied by the sensory division of the nerve and pharyngeal plexus. Taste and smell were both lost on this side, and saliva flowed freely from the mouth. Then the tips of the fingers of the right hand became numb, and rapidly the whole of the right half of the body became involved. This condition usually lasted for twenty or thirty minutes; the numbness departed, inversely to its arrival, and left the tongue last. Between these attacks he says that he feels all right except that he is a little confused in his mind. At times the attacks are succeeded by vomiting, at others by severe purging and abdominal cramps. The right half of the body during the fit is colder and paler than the left, and at ordinary times there is slight impairment on the side of tactile sensibility and of the special senses. He denied ever having had a fit, neither had he found his tongue bitten, or his body bruised when he awoke in the morning, but the pillow was always wet with saliva. I had him watched carefully at night, and there was no doubt whatever about his being the subject of epilepsy during sleep, but of this he was quite unconscious. I forgot to state that during the seizure he was unable to swallow or take a deep breath, and felt as though "his heart was in his mouth."

This case of abortive epilepsy of syphilitic origin, with hemianæsthesia, if it had occurred in a woman, would have been relegated to the uterus or ovary, and be termed hysterical or ovarian, or to a tumour of the centra-ovale, involving the opti-thalamus; but iodide of potassium in two-scruple doses every other night, with Donovan's solution three times a day, cured him.

From records of 274 cases of epileptiform seizures of an undoubted syphilitic origin I summarise my observations very briefly as follows:—

The age of the patient is an important guide. Should a man

or woman be attacked by epilepsy between thirty and forty years of age, without having any hereditary predisposition, or a previous seizure, then a syphilitic cause may be apprehended. And, apart from this, provided that between the attacks there is more or less mental derangement, our basis for a diagnosis is greatly simplified, and it is even more so if there be a paresis more or less profound, localised, or unilateral, but gradually passing off after the epileptiform seizure. The reflex processes are rarely if ever completely absent. The iris may contract under the influence of a strong light; the lips close when the conjunctiva is tickled, and a state of subconsciousness rather than profound coma is a prominent feature from first to last.

The stages of the attack are ill-defined, and merge the one into the other. The universal tonic spasm, with thotonism, rarely presents itself. Pallor rather than cyanosis is the facial exponent, and the duration of the fit is protracted sometimes to many hours, with intervals of wandering, delirium, and excitement. Foaming at the mouth is less common in these cases than a profuse flow of saliva, and all sorts of cries are associated with the seizure; but they are rarely so exalted as Romberg expresses it, "Shrill, and terrifying to man and beast."

And lastly, in reference to albumen in the urine. I have given considerable attention to this point, and I have failed to find it present in any but a few of the cases; but epileptoid seizures, associated with albumenoid syphilis and a plentiful secretion of phosphatic albuminous urine, are not uncommon.

Reviews.

Contributions to the Physiology and Pathology of the Breast and its Lymphatic Glands. By CHARLES CREIGHTON, M.B., Demonstrator of Anatomy in the University of Cambridge. With Illustrations. London: Macmillan & Co., 1878.

ALTHOUGH we should not be inclined to follow the author in all the deductions he has drawn from his observations upon the breast, it is impossible not to see at once that the work which he has done is deserving of all praise, both from the originality and from the care which has been bestowed upon it. The chapters upon the periodical involution and evolution of the breast are especially worthy of attention, for the ground which they traverse has been hitherto untouched. The changes from the condition of rest to that of complete expansion (evolution), and again from lactation back to the condition of complete rest, have been followed in the breasts of the cat, dog, and rabbit, on account of the greater ease and certainty with which this could be done than in the human subject. The period of evolution is found to commence soon after the beginning of pregnancy. The acini slowly enlarge, and the epithelium alters from a few small nuclei through the stages of large pigment cell, lymphoid cell, vacuolated cell, to perfect epithelial cell. It is pointed out that each of these is not a mere change in form of the original cell of the resting period, but that each new form is the product of morphological and functional activity of the cell which immediately preceded it. To this morphological and functional activity of the glandular epithelium are due all the changes which are observed in the unfolding of the gland, the cells varying in form according as one or the other of these two factors is predominant, and the predominance of either varying with the period of evolution. In involution there is the same series of changes as in evolution, but in the reverse order.

So great an importance does Dr. Creighton attach to the power of the glandular epithelium that he attempts to trace all the pathological processes of the breast to this source, and to show that such processes are due to a spurious evolution, the end of

which is disastrous. We could believe with Dr. Creighton, that certain mammary tumours are indeed due to this cause, but when he carries his argument to the extent of tracing inflammatory processes, and what are called connective-tissue tumours, to the same epithelial origin, we are compelled to withhold assent until some stronger proof be given. The connective tissue of the breast is treated as if it were an inert mass, incapable of transformation except through the agency of the glandular epithelium, for which the admiration of the author is so great that we are driven to wonder how he would explain pathological processes in regions of the body which are destitute of epithelium or of glands.

And again, we should find fault with his treatment of the development of the mammary gland, the acini of which are said to arise from precisely the same elements as those which form the surrounding fat, and not by a direct extension of the gland-ducts, which are generally supposed to be downward processes of the ectoderm. Without denying that this may be the true history of the development of the mamma, we cannot but see that the appearances seen in sections might be construed as well to the advantage of the old theory as of that of the author, and that the mere fact of not being able to trace the continuity of tissues in microscopical sections is no proof that such continuity does not exist. An author who attacks generally received opinions lays himself open to attack in return. But even whilst attacking, we have no hesitation in admitting that the work is of the highest possible order, and that although it does not explain all the pathological processes of which the breast is capable, it may assist materially in the explanation of some of them, and thereby become a valuable addition to pathology as well as to physiology.

Practical Chemistry for Medical Students. By M. M. PATTISON MUIR, F.R.S.E., Prælector in Chemistry, Gonville and Caius College, Cambridge. 8vo. pp. 64. London: Macmillan and Co.

THE author of this work has evidently had considerable experience in teaching students, and knows that the attempt to make them learn too much often ends in their learning nothing. He has therefore confined himself to what is absolutely necessary for the M.B. examination; but in imparting the necessary knowledge he has followed an excellent system, and has not only given the necessary facts and methods of working, but has given a lucid explanation of the mode of testing, so that instead of blindly working by rule of thumb the student may know why he uses particular reagents in a definite order. This little book

will thus aid him not only to pass his professional examination in practical chemistry more easily, but will give him such an insight into the subject as will enable him readily to extend his knowledge of it should time and inclination permit.

Synopsis of the Diseases of the Larynx, Lungs, and Heart. By F. DE HAVILLAND HALL, M.D. 8vo. pp. 35. London: Churchill.

THIS work contains in a tabular form the most important points in the diagnosis of diseases of the larynx, lungs, or heart. It is very carefully done, and will prove invaluable to the student of clinical medicine.

The Student's Pocket Book. Arranged by MRS. GARRETT ANDERSON, M.D. London: H. K. Lewis.

THIS is an index of diseases with six blank columns opposite each name in which the students may enter where they have seen a case of the disease, or a post mortem examination, the page of the case book in which the notes of it were taken, the lecture in which it was treated, the specimen of it in the museum, and the books which may have been read upon the subject. It is intended to supply students with a means of registering some of their clinical work so as to be available for after reference as well as to guide their reading and pathological study in connexion with each disease. It seems to us well adapted for both purposes.

A Handbook of Uterine Therapeutics and of Diseases of Women. By EDWARD JOHN TILT, M.D., &c. Fourth edition. pp. 472. London: Churchill. 1878.

THE fact of a book's having reached a fourth edition implies the consumption of three previous editions, and would seem to answer beforehand any such criticism as that the book was not needed, or that it failed to supply a need. We must, however, always remember that in the present most unsatisfactory state of general knowledge of the diseases of women, books from the pens of men of experience are eagerly waited for to assist practitioners in their somewhat disheartening search after knowledge, and above all after facts.

This groping is all the more hopeless as the facts of one man are the fictions of another, and the gynæcological creed which would be drawn up by the chiefs of that department, on which all were agreed, would pre-eminently possess that quality which is the soul of wit.

The author of the work before us is a man of large experience, and the results of his experience are often very interesting,

notably those chapters at the beginning and end of his book which deal with the large questions of general treatment of women, and the prevention of their diseases, which is better than cure.

His remarks on their physiological peculiarities (p. 3), and on their mental characteristics (p. 18), one of the strongest of which, for good or bad, is the necessity of sympathy, are worthy of all attention.

The chapter on "Prevention" is the best in the book. We are thankful to hear a strong condemnation of the reckless uterine surgery (in the chapter on Hysterotomy, p. 59), by which, often for comparatively slight inconveniences, the life of a patient is risked. Dr. Tilt is not an advocate for the "surfeiting and drunkenness" which we sometimes hear is essential for the cure of uterine atony, but his low diet is one which induces us to ask what then would the full diet be. Those who are afraid of being starved by him should read page 73.

Again, he is not an apostle of the displacement theory and says well, in speaking of this subject: "It seems as if the authors had vouchsafed books on uterine pathology to discover all the possible symptoms of the various forms of uterine disease, . . . and a twist of the mind has been accounted for by a twist of the womb." But for all that it is hard to gather his own views, which must by this time be capable of formulation.

We think he is quite right in lifting his voice against marriage at an immature age, and in laying down that the age of 21 is quite soon enough. It will take some time to convince mothers of this, at least as long as they are foolish enough to claim credit for the early age at which their daughters are betrothed and married.

But we confess to being disappointed with the arrangement of the book; it is hard to find what one wants to refer to, and when it is found, there is often no reason why it should be classified where it is placed. The author seems to be without a definite ground-plan, and to fly from therapeutics to pathology as the humour takes him. It would have been better to write on treatment, giving under each remedy its indications, methods, and abuses, or to have written on the diseases. But the book would most easily fall into the form of a series of essays and observations on various matters, and Heberden would have been a good model for Dr. Tilt, seeing that the experience of mature age is valuable, but should not be mixed up with the suggestions and methods of other men, of many of which the author has honestly to plead ignorance.

As a text-book the work lacks method and is unequal; it is moreover occasionally garrulous. A text-book bearing the date 1878 should not fail to contain a notice of the Paquelin thermo-

cautery in the chapter on caustics, nor of the mode of performing local depletion with a lancet. If the retroversion of the gravid womb is mentioned, there should be a page on which to find it, whereas on pages 316 and 345 we find a few very insufficient words, which really come under the head of vain repetitions.

Again, under the head of *Pruritus vulvæ*, no mention is made of diabetes, nor any hint given that the urine should be examined for sugar. Uterine polypi are dismissed in some ten lines on page 356. The chapter on *Hysteria* is not a happy essay on a subject of which all know a little, but which requires formulation; we rise from its perusal without perceiving any distinct idea present in the mind of the writer.

The operation called "normal ovariectomy" is discussed in several places, but we do not gather Dr. Tilt's opinion of the operation, its justifiability, nor the cases in which it may be indicated.

The same remark applies to Dr. Atthill's intra-uterine application of nitric acid, and to the paragraph on stricture of the cervical canal as a cause of sterility. On page 418 it is said, "It is obvious that the semen must pass with difficulty through a canal that does not readily admit a bougie," but on the next page the author ridicules the idea of microscopic "animalculæ" requiring a large canal.

The paragraph on *Vaginismus* is also unfortunate. The author says, "I have very seldom known this state to exist except as a symptom of vaginitis or of chronic metritis." Surely the whole meaning of the word, formed on the analogy of "*Laryngismus*," is—*functional* spasm, *not* traceable to coarse lesions. The cases of *Vaginismus* are, it is true, somewhat rare, but a classical case, such as has been recorded more than once, presents genitals objectively healthy, and the *Vaginismus* remains uncured even by the birth of a full-time child.

We are sorry that this work should be marked by more than a fair allowance of easily avoided imperfections of expression and orthography; there are also several phrases in it which had better have been omitted. Yet with all its faults it contains much good matter, and although Dr. Tilt tells us that it is his last work, we hope he will re-consider his decision, and issue another edition revised and improved.

Lectures on Surgical Anatomy. By JOHN CHEINE. Edinburgh: David Douglas.

ONE of the greatest improvements recently introduced into the scheme of teaching in the medical schools is the institution of a distinct course of lectures or demonstrations on surgical anatomy.

The College of Surgeons now requires of the student presenting himself for the diploma examination, a certificate of his having attended a class in which he has been specially instructed in the application of anatomical facts to surgery. The advisability of this special course will not be doubted by any one who bears in mind how important anatomy is as a basis for surgery, how easily and completely students forget their anatomy when the first examination at the College has been passed, and how great a difference there is between anatomy studied merely in itself, and anatomy applied to surgery. To help forward this movement Mr. Luther Holden some years since wrote his well-known and deservedly popular "Surgical Landmarks," and now Mr. Cheine has published the work before us. It consists of the lectures which form his annual course in the Edinburgh School of Medicine. In the first section of the volume all the important parts of the body are described. The latter portion consists of coloured lithographic plates. The chapters devoted to the description of the various regions are made interesting by the introduction of numerous references to surgical questions. Thus in treating of the various joints, the dislocations which they may present are described, and the methods of reduction are given, and in studying the bones, the fractures to which they are liable, and their treatment are referred to; again, in the case of hernia, after the anatomy of the various forms has been set forth the author refers to the operations that may be required should strangulation occur. In like manner the operations for ligaturing the arteries are given. We have looked very carefully through his pages, and we find Mr. Cheine very accurate as to his facts, and very concise and graphic in his descriptions. There are a few points on which we should venture to criticise his opinions. Thus in lateral lithotomy he recommends that the staff should be drawn up "as much as possible to the pubes." This proceeding will, however, in cases of deep perineum enormously increase the difficulties of the operation by lifting the parts upwards and inwards beyond the reach of the finger. A medium position of the staff, neither too much drawn up to the pubes, nor over much depressed towards the rectum will, we think, be found most satisfactory. We are not prepossessed with the staff which the author employs—made with a straight distal portion placed, not as in Buchanan's instrument, at right angles with the stem, but at an obtuse angle, in such a way as must, we should think, depress its point into dangerous proximity to the rectum. Mr. Cheine is little in favour of tapping the bladder in cases of impassable stricture. He remarks, "such an operation will afford only temporary relief, and, in my opinion, an operation which will at one and the same time cure the stricture and relieve the distended bladder is to be preferred."

It may, however, on the other side be remarked of external urethrotomy (the alternative operation to which Mr. Cheine alludes), (1) that it does not *cure* the stricture, but may if great care be not afterwards taken, rather aggravate it. (2) That it is vastly more dangerous than tapping the bladder (one of the safest operations in surgery when skilfully performed). We know of no more satisfactory cases than those in which, after tapping the bladder and keeping the patient for two or three days at rest in bed, a stricture which was previously impervious is found easily to admit a No. 2 or No. 3 catheter. In the aspirator we have a means by which the bladder may be safely and readily emptied; and the surgeon will often find that in two or three days a catheter can be passed. We have dwelt on these subjects we confess, because we have found so little else to criticise in Mr. Cheine's excellent work. The thirty-one coloured lithographic plates represent special dissection, chiefly by the author. They are of good size, and are admirably executed. We may fairly say of them that they are the best plates of the kind with which we are acquainted. We have no hesitation in pronouncing Mr. Cheine's book a great success.

Clinic of the Month.

Treatment of Wounds of the Superficial Palmar Arch by a Acupressure.—Mr. Bellamy believes that this simple method of treatment for serious wounds of vessels is not practised as frequently as it might be. He gives a case of a lad who divided the ulnar artery in the hand with a knife. He applied an Esmarch's bandage, but hæmorrhage soon recurred. He then plugged the wound and bound the hand firmly to a dorsal splint, but without effect. He returned bleeding as profusely as before. Mr. Bellamy then determined to try acupressure, and taking a stout hare-lip pin, passed it through the tissues about half an inch from the edge of the cut, under the artery, and out again to a corresponding distance the other side of the wound, and placed the limb again upon the splint. This had the effect of entirely stopping the bleeding; the needle was taken away on the fourth day, and the entire wound had closed by the end of the week. (*Lancet*, Sept. 21, 1878.)

Treatment of Malignant Cholera by the Hypodermic Injection of Chloral-hydrate.—Surgeon-Major Augustus R. Hall records an interesting case in which the wife of a soldier at Gwalior was attacked with cholera. The attack was very sudden, the patient feeling well till after breakfast. At 11 A.M. she felt uncomfortable and oppressed, and lay down. She went to sleep, and on awaking at 1 found that copious watery evacuations were literally flowing from her. Vomiting and cramp soon set in. She was then admitted into the hospital with the usual symptoms of a severe attack of cholera—collapse, blue lips, shrivelled fingers, voice sepulchral, pulse imperceptible. Shortly after admission one scruple of chloral-hydrate dissolved in three ounces of water was given by the mouth, but was rejected. At 4 P.M. six grains of chloral dissolved in sixty minims of water were injected into the substance of the left deltoid muscle, the point of the instrument being shifted without withdrawal. Half an hour after sixty more minims were injected. The temperature in the axilla now began to rise steadily. By 6 P.M. eighteen grains of chloral had been injected, and the thermometer

registered 97·8° F. The cramps had ceased and the vomiting was much less. Some serous evacuations had passed. At 7 she passed a small quantity of urine. From this time onward small quantities of chloral were injected, and the patient progressively improved to perfect recovery. In commenting on this case Surgeon-Major Hall calls attention to the fact that a resonant sound was emitted by the usual area of cardiac dullness, and that the sounds of the heart were almost entirely absent; and he thinks that at the commencement of an attack the contractions of the heart become more forcible, the calibre of the arteries becomes smaller, and there is generally increased arterial tension, probably caused by excessive stimulation of the vaso-motor centre. As the cold stage becomes intensified there is almost a continuous systole, no time being allowed for diastole. The absence of the pulse at the wrist is due therefore to an opposite cause than in syncope, the vessels and the heart being alike intensely contracted. Acting on this theory, he maintains that stimulants, useful in syncope when the heart is flaccid and relaxed, are harmful in cholera. The treatment he recommends is that all premonitory diarrhoea should be stopped with gingerade made with sulphuric acid, which last should be taken in half drachm to one drachm doses. No alcohol or opium should be given, but plenty of iced water; and chloral injections into muscles should be at once commenced; nourishing soups may after a time be given, and if secondary fever follow, quinine may be administered. (*British Medical Journal*, Sept. 21, 1878.)

Treatment of Sanguineous Cerebral Apoplexy by Hypodermic Injection of Ergotine.—Dr. N. S. Foster observes that the utility of the subcutaneous injection for the exhibition of the active principle of ergot, on account of the rapidity and comparative certainty of its action, has been most successfully demonstrated in cases of post-partum hæmorrhage. From the explanation given of its inducing contraction of the smaller arteries and from the facility of its administration, especially in cases where swallowing is at least very difficult, he was led to use it in cases of cerebral apoplexy and also of hæmoptysis. He records two cases, in each of which the patient was attacked with symptoms characteristic of an apoplectic lesion, the coma gradually deepening. On the injection of ergotine into the arm the comatose state became stationary and the grave symptoms rapidly passed off. (*Lancet*, Sept. 21, 1878.)

The Action of Arsenic.—The effect of arsenic upon animals has lately been carefully studied by Gies, who has administered to rabbits, fowls, and pigs during months, gradually increasing doses of arsenious acid, the daily dose being—rabbits ·05 to 7 milligrammes, fowls 1 milligramme to 8 centigrammes,

and pigs 5 milligrammes to 5 centigrammes. All the animals became heavier and fatter, and there was considerable growth of bone, both epiphysial and periosteal. In all parts of the bones in which there is normally spongy substance the animals fed with arsenic presented compact bone. The carpal and metacarpal bones for example were compact throughout, and beneath the cartilages of the epiphyses was a compact layer of bony hardness, just as in animals fed with phosphorus. The bone corpuscles of this layer are smaller and less numerous; the Haversian canals are smaller and fewer than normal. These changes were observed after only nineteen days' feeding. Strangely enough, however, the same bone-changes were found in other animals kept in the same stall as those which were fed with arsenic. Gies attributes this to the excretion of the arsenic by the skin and lungs of the animals to which it was administered, and its absorption by the others. Similar changes were found in the bones of animals which were kept in a cage beneath the perforated floor of which arsenic had been scattered. Adult animals fed with arsenic presented a considerable thickening of the cortex of the long bones, and with this there was produced more or less fatty degeneration of the muscular tissue of the heart, of the liver, of the kidneys, and even of the spleen. If the dose of arsenic was further increased the changes in the bone were masked by those of chronic arsenical poisoning, gastritis and hyperæmia of the whole intestinal tract, and intense fatty degeneration of various organs. The young produced by rabbits during the process of poisoning were dead but large in size, and presented a commencing osseous change similar to that described, and also a considerable hypertrophy of the thymus. (*Lancet*, July 27, 1878.)

A point in the Diagnosis of Spinal Sclerosis.—Dr. T. Buzzard observes that if a healthy man sit with one knee-joint resting upon the other (a very common attitude), and the ligamentum patellæ of the supported leg be smartly struck just below the knee-cap with the side of the hand, a sudden contraction takes place of the quadriceps femoris muscle (of which the ligamentum patellæ represents the tendon), and the foot is consequently jerked upwards in a degree which varies in different individuals. Now in confirmed examples of locomotor ataxy this reaction does not take place; no matter on what part of this ligament below the knee-cap, or with what force the blow is struck, the foot hangs motionless. Dr. Buzzard shows that the contraction of the muscle is not a reflex from the skin, since if this be raised and pinched or otherwise stimulated, no contraction occurs, whilst if it be frozen or anæstheticised the sharp blow still produces contraction. Tschirijew found that

division of the cord in guinea-pigs above the place of exit of the sixth pair of lumbar nerves caused the phenomenon to disappear. Dr. Buzzard attributes it to some excitation of the nervous fibres belonging to the tendon. (*Lancet*, July 27, 1878.)

Application of the Shellac Cloth or Poroplastic Spinal Jacket.—Mr. J. C. Hutchinson, of the Brooklyn Orthopædic Infirmary, recommends the following material and mode of application in cases of spinal caries, and of diseases of the hip and knee-joints. The felt, or, as it is called, shellac cloth, should be of a somewhat heavier kind than that employed by hatters. Then the patient, being suspended in a Sayre's swing, the following measurements should be taken:—

1. From a point one and a half inches to one side of the linea alba, on a line with the anterior superior spinous process of the ilium, around the back of the pelvis, to a corresponding point on the opposite side.
2. From a point one and a half inches to one side of the middle of the sternum, around the back of the thorax, to a corresponding point on the opposite side. These measurements will leave a space in front for lacing.
3. From the seventh cervical vertebra to the top of the sacrum; slits are cut in the lower edge of the splint an inch long and two or three inches apart, so as to allow the lower part to mould itself more accurately to the pelvis, and thus get a better base of support. It should also be cut away under the arms. The chest is now covered by a well-fitting woollen shirt or flannel bandage, the patient being suspended. The felt, made pliable by dry heat or steaming, or by immersion in very hot water, is quickly applied, and covered with a bandage from below upwards very firmly, so as to mould it to all the inequalities of the surface. The splint almost immediately regains its inflexibility. It may then be removed, trimmed up, and holes punched along the front edges and reapplied. Two brace-straps may be attached to the top edge of the splint, which cross over the shoulders and buckle in front. The splint may be made more comfortable in hot weather by perforating here and there with a punch. The splint for a child weighs only eight to twelve ounces, very much lighter than a plaster of Paris jacket, is comfortable, more cleanly, and more easily applied, while it fulfils all indications. (*Lancet*, Aug. 31, 1878.)

Extracts from British and Foreign Journals.

Eserine and Pilocarpine in the Treatment of Eye Disease.—Dr. Henry W. Williams, Professor of Ophthalmology in Harvard University, read a paper at Boston last January, in the course of which he states that it is now fifteen years since the calabar bean was introduced to the profession as an agent having the till then unattainable quality of producing at will contraction of the pupil. But the supply of the remedy, previously unknown to commerce, was limited; and it is only recently that its alkaloids, eserine and physostigmine, have been readily obtainable for therapeutical purposes and physiological experiment. Dr. Williams has made extensive use of eserine in the treatment of corneal ulcers during the past two years. The great number of cases of ulceration in strumous children, and of traumatic and other ulcerations in adults, presenting themselves at the ophthalmic department of the Boston City Hospital, together with those occurring in private practice, have afforded abundant opportunities for observation and comparison, and have allowed of an estimate as to the value of treatment which could not be conclusively based on merely a few cases of a disease so variable in its severity and duration. He calls in question the use of solutions of atropia, maintaining that by expanding the pupils it tends to keep up the morbid processes; whilst it seemed to him that eserine, by its strong contractile action on the pupil, limiting very much the amount of light which would reach the retina, might lessen the reflex action causing the spasmodic contractions, and thus prove of great advantage. The results of trial have fully justified his anticipation. In strumous corneal ulceration in children there is little chance that the iris will be involved by contiguity; therefore no objection exists to the use of eserine. If a drop of a solution of sulphate of eserine is put into the eye (two grains to an ounce of water), it causes the pupil to contract strongly in about fifteen minutes, and this effect continues for some eight hours. It should be used in the morning, at which time the photophobia is greatest, so that its effect may continue during the day, and may be repeated in the afternoon if required. Its application causes little or no pain.

A solution of eight or ten grains of borax to an ounce of water may also be used twice a day or oftener, as an auxiliary to lubricate the ulcerated surface and soothe its irritability. In phlyctenular, or herpetic eruptions of the conjunctiva or of the epithelial layer of the cornea, eserine is of service, especially when photophobia is present. In traumatic or gonorrhœal ulceration, in ulcerations of the cornea in persons advanced in life or following exhaustive disease, and in creeping ulcer (*ulcus serpens*), Dr. Williams's experience with eserine has been favourable. In the paralysis of accommodation and mydriasis, often resulting from diphtheria and sometimes from measles or scarlatina, eserine is very effective in abbreviating the duration of the abnormal condition. The obvious effects of the instillation of a drop of a solution of two grains of eserine sulphate in an ounce of water into a healthy eye usually begin to manifest themselves within fifteen minutes. The pupil contracts strongly, becoming perhaps not more than a millimetre in diameter; there is often twitching of the lids, and sometimes supraorbital pain, which, though usually slight, may be considerable. Vision is dim, as if the sun were eclipsed. This dimness depends on the narrowness of the pupil, which admits of the passage of only a limited amount of light. There is also spasm of the accommodation, and an induced myopia, which often reaches in a few minutes a very high degree. If this latter is corrected by a concave glass of equivalent power, vision for large objects becomes nearly normal. As regards the effects of eserine upon the cornea, recent researches seem to prove that the activity of the circulation is increased, that the pressure within the anterior chamber is lessened, that the action of accommodation is excited, and that the radius of curvature is shortened during its use.

Drs. Weber and Laqueur commend the use of eserine, as also of pilocarpine, in glaucoma, not at present at least as a substitute for the operative treatment by iridectomy, but as auxiliary means. In Dr. Williams's own experiments made with the chlor-hydrate of pilocarpine the results obtained have differed a little from those produced by eserine sulphate, in the facts that less conjunctival irritation, less supraorbital pain, and less spasm of the accommodative power seemed to be induced, while the contraction of the pupil and the temporary myopia corresponded in degree with those following the use of eserine. We have therefore unquestionably two myotic agents capable of rendering immense service in ocular affections, and probably of use in other diseases, especially of the nervous system. (*Boston Medical and Surgical Journal*, March 14, 1878.)

Local Treatment in Diphtheria.—Dr. A. W. Hagenbuch, of the Cook County Pauper Institution, America, gives an account

of an epidemic of diphtheria in which thirty-three patients were treated. The marked features of the epidemic were the limitation of the affection to one house, showing its very slightly contagious nature, the rapid invasion and unfavourable progression if not interfered with, the low rate of mortality, the subsequent anæmia, and, above all, the unmistakable benefit derived in nearly every case in which vigorous local treatment was employed. In all cases, no matter what general treatment was adopted, if the local applications were discontinued for a single day, the case was invariably worse, the cough and difficulty of breathing being especially aggravated. The local applications principally employed consisted of equal parts of tincture of the chloride of iron and dilute nitric acid. The mouth was first rinsed, and the secretions and detached membranes removed with a dry swab, and the above preparation was then applied with a soft brush. There was only one fatal case. (*Chicago Medical Journal*, vol. xxxiv., No. 3.)

The Use of Ergot in Typhoid Fever.—M. Duboué of Pau recommends ergot in typhoid fever for reasons deduced from its physiological action, and in one of his works cites seven cases in which it was employed. Two were in the early stages and presented all the characteristic symptoms of the malady, but they got well so soon that it was thought that an error in diagnosis was possible. In three others ergot was not used until after all other medicinal resources had been exhausted, and the patients had reached an almost hopeless state. But they all recovered after taking from a gramme and a half to three grammes of ergot daily for about two weeks. Another, who presented grave ataxic symptoms from the outset, with delirium, trismus, carphologia, and intermittent pulse, took ergot for twelve days, the disease assuming a milder form and recovery following. Finally, a patient with typhoid fever, who was three and a half months pregnant, was treated with ergot for fifteen days, and got well without miscarriage, although she took a daily dose of a gramme and a half or two grammes of the drug. (*Boston Medical and Surgical Journal*, March 28, 1878.)

Damiana (Turnera Aphrodisiaca).—Dr. Summerlin of Sunhill, Ga., states that having seen this drug recommended for its aphrodisiac virtues, he determined to give it a trial in the case of a patient, aged twenty-seven, who applied to him for treatment. The patient stated that a few years previously his right testicle became inflamed, compelling him to remain at home for several days. After the swelling left, the testis became atrophied and tender to the touch. He had previously practised onanism. The sexual desire had nearly left him. On examination the left testis was found to be soft and very small, the

other normal. He was placed upon the usual treatment—nourishing food, nux vomica, iron, and cantharides; but he did not appear to improve. He was then ordered to take one drachm of fluid extract of damiana three times a day. In a short time the testis began to enlarge and lose its sensitiveness. In the course of a month it had regained its normal size, and its functional activity was restored. (*Virginia Medical Monthly*, June, 1878.)

The Physiological and Therapeutic Action of Jaborandi.
—O. Kahler gives as the result of his observations on jaborandi that, given in moderate doses, it produces approximation of the far point, diminished blood-pressure, as shown by Marey's sphygmograph, with secondary increase in the rapidity of the pulse; when given in large doses it causes retardation of the pulse, with at first lowering, but subsequently increase, of the blood-pressure. The slowing of the pulse depends on an exciting action, opposed to that of atropine, exerted upon the inhibitory ganglia in the heart (Leyden came to the same conclusion in regard to pilocarpin). He established its antidotal action to atropine, but found that it is much feebler than this poison. As a general rule he prefers the subcutaneous injection of pilocarpin in maximum doses of 0.024 of a gramme, when jaborandi has to be used internally. In diabetes mellitus he observed no action exerted by jaborandi on the quantity of sugar excreted, providing the digestion was not interfered with. In a case of diabetes insipidus, on the other hand, the administration of the drug reduced the quantity of urine in three days from 6-8000 grammes to 2-3000; the body weight of the patient did not undergo any increase, but the general health and strength improved materially. In bronchitis acuta and in chronic dry catarrhs Kahler recommends this remedy strongly, and especially also in parotitis occurring in the course of severe infectious diseases; and suggests that it should be tried in mumps. He considers that the affections in which it is likely to prove useful are rheumatic diseases, recent neuralgia, dropsy without cardiac debility, the existence of such debility being a contra-indication; hydræmia and nephritis, uræmia, and, lastly, chronic metallic poisoning. (*Prager med. Wochenschrift*, No. 33 and 34, 1877; and *Centralblatt f. d. med. Wiss.*, April 27, 1878.)

Notes and Queries.

LIQUOR SANTAL FLAVA CUM BUCHU ET CUBEBA. — This preparation appears likely to become a favourite prescription in cases of gonorrhœa and gleet. It contains three remedies of proved utility in these diseases, the santal oil especially having a very extraordinary power to arrest certain cases of gleet. Experience has shown this preparation to possess the same efficacy as the santal oil itself. It mixes perfectly with water and has a taste by no means disagreeable, in which particular it contrasts very favourably with the ordinary mixtures it is intended to replace.

LIEBREICH'S SYRUP OF CHLORAL. — The syrup of chloral which we noticed several months ago is now prepared by Messrs. Corbyn, of the same strength as that of the British Pharmacopœia.

CHAULMOOGRA OIL. — We have received from Messrs. Corbyn, Stacey, and Co. a specimen of this oil, which is obtained from the *gynocardia odorata*. It has been used in India with considerable success in the treatment of leprosy, tinea and herpes, as well as scrofula and rheumatism. It has also been employed in consumption, but further trials will be required to establish its utility in this disease. On account of its useful properties it has been admitted into the Pharmacopœia of India, and directions are there given for the preparation of Chaulmoogra ointment or unguentum gynocardiæ. This ointment is also prepared by Messrs. Corbyn. As the oil has a slightly nauseous taste they have put it up in perles, each of which contains four minims, and which can be swallowed without the taste of the oil being detected.

OZOKERINE. — This is a smooth yellowish substance prepared from earth-wax, and resembling some of the paraffines in appearance. It appears bland and non-irritating, and likely to prove useful as a dressing for wounds and excoriations.

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* * Any of the foreign works may be procured on application to Messrs. DULAU, of Soho Square, W.C.; WILLIAMS and NORGATE, of Henrietta Street, Covent Garden, W.C.; or BALLIÈRE, of King William Street, Charing Cross.

Department of Public Health.

ILLUSTRATIONS OF THE ARREST OF INFECTIOUS DISEASE BY ISOLATION OF THE SICK.

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THE following remarks are extracted for the most part from my annual reports to some of the sanitary authorities in my district. They serve to illustrate what may be done in arresting the spread of infectious diseases, both when they first arise and when they have become epidemic, by the erection of temporary structures for isolation of the sick.

I would not have it understood, however, that I am an advocate for deferring the provision of such accommodation until the occasion for it arises. Rather I would urge that the facts here stated show, as it seems to me, conclusively the great advantages which would arise in arresting the spread of infectious diseases if sanitary authorities were in all cases provided beforehand with the means for isolating the earliest cases.

In 1877 a serious outbreak of small-pox occurred in Newark, a town of about 13,000 inhabitants. The disease was first imported by a tramp, who stated that he had come from Melton Mowbray.

There were no vagrant wards in the town at that time, as the workhouse is at Claypole, six miles away; consequently all vagrants who came into the place had to be put up at a common lodging-house in Water Lane, which is an overcrowded

part of the town, where there are many houses built back to back.

The man was first taken ill on April 20th, and neither I nor anybody else connected with the sanitary authority received any intimation of his illness until nearly a month afterwards, when he had recovered. He had not been vaccinated, and had the disease in a very severe form.

The Sanitary Authority drew the attention of the keepers of all common lodging-houses to Sections 84 and 86 of the Public Health Act, 1875, and informed them that if in future they did not give immediate notice of the occurrence of any cases of infectious diseases in their houses they would be proceeded against.

The next case was that of a woman in the same common lodging-house. She had helped to remove the bed on which the man had slept when it was taken away to be burnt by order of the Sanitary Authority, he having been sent to another house behind a neighbouring public-house.

As soon as she began to be ill—but, I was told, before the disease had definitely declared itself—she was sent away, when a neighbour, seeing that she was too ill to travel, took her, together with her husband and child, into her house in Tallent's Row, adjoining the common lodging-house, on June 5th. They remained there till June 7th, when they went away to Southwell.

I have since heard from Mr. Calvert, of that town, that she was admitted into the workhouse there on June 7th suffering from confluent small-pox, and died on June 14th. He said he never saw a more virulent case, but could make out nothing as to vaccination from appearances. He stated that she prevaricated so, that he could not believe one word she said. Therefore I am unable to say whether she had been vaccinated or not.

The above-named house in Tallent's Row has only one bedroom, and is occupied by eight persons, so that for two nights eleven persons slept in the house.

One of the girls living in the house began to be ill with small-pox on June 16th, another on June 17th, and two others on June 19th, their eruption appearing on that day, so their illness must have begun on the 16th.

I could find no marks of vaccination on two of the girls, aged twelve and nine. They had the disease very severely, but recovered. The other two girls, aged sixteen and fourteen, had each one vaccination mark. They had the disease less severely, and recovered.

There are seven back-to-back houses in the Row, and there is only one entrance to it, so that proper change of air is impossible, and the infection had every chance of spreading to unprotected persons; consequently I reported to the Sanitary Authority that, unless the cases could be isolated, I feared the disease would take a hold on that thickly-inhabited part, and if it did, that it would in all probability be conveyed to other parts of the town.

As there was no hospital I suggested that a temporary one should be put up. This was decided to be done.

After the prevalence of scarlatina in this town in 1874, when there were sixty-two deaths from that disease, I suggested the desirability of the Urban and Rural Sanitary Authorities of Newark combining together to erect a permanent hospital for infectious diseases. In 1875 it was decided that this should be done, but the plan fell through and has never been carried out.

I cannot help remarking that if it had been, there is every probability that the disease would have been limited to the first, or first and second cases, then, many unnecessary cases of disease and deaths would have been averted, and the town would have been saved from the serious expense which it has been put to by this outbreak, and which would have gone a long way towards defraying the cost of a permanent hospital for the Urban district.

Some delay in beginning the temporary hospital was caused by the difficulty in procuring a site, &c., but at length one was obtained, very pleasantly situated and surrounded with fine elms, about a mile from the town, by the side of the Great Northern Railway, at the Barnby Crossing. It was begun on July 23rd and was not ready for occupation until August 9th, some time having been lost owing to the building having been lined with lath and plaster, instead of with wood, as I strongly recommended should be done.

In addition to this building there were provided two hospital

marquees and four Netten-Radcliffe Hospital tents for the patients, a bell tent for the doctor, and two small wooden huts (a double one and a single one) for the attendants, also huts for kitchen and washhouse. A description of the whole will be found in another part of this paper.

A medical man from London, Mr. Horace Lowther, was engaged to reside at the hospital, and it affords me much pleasure to bear public testimony to the admirable manner in which he attended to the patients and administered the affairs of the establishment. The success of the hospital was due in no small degree to the energy and skill displayed by him.

At first some nurses from London were engaged, but afterwards, on the recommendation of Dr. Thorne Thorne, who visited the hospital, the Lady Superintendent of St. Margaret's, East Grinstead, was applied to, and Sister Marion then took charge of the nursing arrangements. Her care of the patients and devotion to their interests were above praise. The good influence she exercised over them was very manifest.

In the meantime the disease had spread, nearly fifty cases and six deaths having occurred by the time the hospital was ready for occupation. The following list details the particulars of each case that arose out of the outbreak as far as the cases came to my knowledge:—

Date.	Sex.	Age.	Residence.	Admitted to Hosp.	Dischd. from Hosp.	Character of Disease.	Result.	Vaccination.
April 20	M.	25	Water Lane	No	—	Very severe	Recovered	Unvaccinated.
June 4	F.	50	Water Lane	„	—	„	{ Died { { June 14 }	Not ascertained.
„ 16	F.	14	{ Tallent's Row, Water Lane }	„	—	Moderate	Recovered	One mark.
„ 16	F.	12	„	„	—	Very severe	„	Unvaccinated.
„ 16	F.	9	„	„	—	„	„	Unvaccinated.
„ 17	F.	16	„	„	—	Moderate	„	One mark.
July 9	F.	13	„	„	—	Very severe	{ Died { { July 20 }	Unvaccinated.
„ 12	M.	15	„	„	—	„	{ Died { { July 25 }	Unvaccinated.
„ 14	M.	17	„	„	—	„	Recovered	„
„ 16	F.	16	Water Lane	„	—	Modified	„	One good mark.
„ 22	M.	9	Farndon Row	„	—	Very mild	„	Three very small mks.
„ 25	M.	15	{ Tallent's Row, Water Lane }	Aug. 9	Aug. 15	Discrete	„	{ Four places about four days after in- fection was taken.
„ 28	M.	8	„	„ 9	„ 15	Modified	„	Two fair marks.
„ 23	F.	34	George Street	„ 9	„ 25	Mild	„	One fair mark.
„ 29	F.	21	{ Tallent's Row, Water Lane }	„ 11	„ 17	{ Very mo- dified }	„	Three good marks.
„ 31	M.	28	{ Smith's Row, Water Lane }	„ 13	Died	Confluent	{ Died { { Aug. 19 }	Unvaccinated.
„ 31	M.	19	Kirkgate	„ 10	Sept. 28	Simple	Recovered	One mark.
Aug. 1	F.	17	{ New Entry, Water Lane }	„ 9	„ 15	{ Semi- confluent }	„	Two marks.
„ 2	M.	23	{ Ridley's Yard, Northgate }	„ 9	Aug. 25	Moderate	„	Two fair marks.
„ 2	M.	13	{ Smith's Row, Water Lane }	„ 16	Died	Confluent	{ Died { { Aug. 16 }	Unvaccinated.
„ 3	F.	8	„	No	—	„	{ Died { { Aug. 16 }	„
„ 3	F.	20	„	Aug. 9	Died	„	{ Died { { Aug. 14 }	One mark.
„ 3	M.	4	{ "Ship" Public Ho. Water Lane }	No	—	„	{ Died { { Aug. 10 }	Unvaccinated.
„ 3	F.	3	„	„	—	„	{ Died { { Aug. 9 }	„
„ 3	M.	22	{ Smith's Row, Water Lane }	Aug. 10	Sept. 1	Moderate	Recovered	One mark.
„ 3	M.	18	Well's Yard	„ 9	Aug. 20	Simple	„	Vaccinated.
„ 3	M.	12	Northgate	No	—	{ Very mo- dified }	„	„
„ 3	M.	14	„	„	—	Mild	„	„
„ 3	F.	22	„	„	—	Very Mild	„	„
„ 3	F.	23	„	„	—	{ Very mo- dified }	„	„
„ 4	F.	4	{ Smith's Row, Water Lane }	Aug. 10	Sept. 28	Confluent	„	Unvaccinated.
„ 4	M.	16	{ Tallent's Row, Water Lane }	„ 9	Aug. 27	Moderate	„	Two marks.
„ 4	F.	32	{ Smith's Row, Water Lane }	No	—	Discrete	„	Three marks.
„ 4	M.	38	{ Collingham Row, Northgate }	Aug. 9	Sept. 28	Confluent	„	Inoculated.
„ 5	F.	15	Water Lane	No	—	{ Very mo- dified }	„	Three indistinct mks.
„ 5	M.	40	{ Smith's Row, Water Lane }	Aug. 10	Aug. 20	Mild	„	Two indistinct mks.

Date.	Sex.	Age.	Residence.	Admitted to Hosp.	Dischd. from Hosp.	Character of Disease.	Result.	Vaccination.
Aug. 5	F.	23	Northgate	No	—	{ Very modified }	Recovered	Vaccinated.
„ 5	M.	60	{ Northern Bldgs., Lover's Lane }	„	—	„	„	„
„ 5	M.	7	{ Hudson's Row, Northgate }	Aug. 10	Aug. 18	Very mild	„	{ Four irregular marks nearly cover $\frac{1}{2}$ sq. inch. }
„ 6	M.	21	{ Tallent's Row, Water Lane }	„ 11	Sept. 22	Confluent	„	One mark.
„ 6	F.	18	„	„ 9	„ 6	{ Semi- confluent }	„	Two marks.
„ 6	M.	16	{ Collingham Row, Northgate }	„ 9	Aug. 18	Moderate	„	„
„ 6	F.	17	Balderton Gate	No	—	Modified	„	Vaccinated.
„ 7	M.	27	{ Smith's Row, Water Lane }	Aug. 10	Sept. 28	Simple	„	Two marks.
„ 7	M.	20	„	„ 10	Aug. 20	„	„	Vaccinated.
„ 7	F.	23	Water Lane	No	—	Confluent	{ Died { Aug. 12 }	Unvaccinated.
„ 7	M.	28	{ Duke's Row, Lover's Lane }	Aug. 13	Aug. 20	{ Very modified }	Recovered	Four faint marks.
„ 8	F.	7	{ Smith's Row, Water Lane }	„ 10	(?)	Moderate	„	Two imperfect mks.
„ 8	F.	33	{ New Entry, Water Lane }	„ 11	Sept. 28	Confluent	„	Two marks.
„ 8	M.	24	{ Bell's Row, Northgate }	„ 11	Died	„	{ Died { Aug. 20 }	Unvaccinated.
„ 9	M.	24	Northgate	„ 13	Sept. 15	Simple	Recovered	Three marks.
„ 9	M.	20	{ Newnham Road, Northgate }	No	—	Mild	„	Vaccinated.
„ 10	M.	13	Northgate	„	—	Severe	„	Unvaccinated.
„ 10	M.	8	Water Lane	Aug. 30	Died	Confluent	{ Died { Sept. 16 }	Two marks.
„ 10	F.	50	Northgate	No	—	Very mild	Recovered	Four marks.
„ 18	M.	18	{ Hudson's Row, Northgate }	Aug. 21	Sept. 4	Simple	„	Two good marks.
„ 19	M.	35	Northgate	„ 23	„ 28	{ Semi- confluent }	„	One mark.
„ 22	F.	16	„	„ 25	Oct. 8	„	„	Unvaccinated.
„ 25	F.	36	„	„ 29	Sept. 29	Simple	„	Two marks.
„ 26	M.	9	„	„ 30	„ 8	„	„	Two small marks.
„ 30	M.	17	Wheatsheaf Yard	Sept. 1	„ 22	„	„	{ Two large marks, $\frac{1}{2}$ sq. inch. }
Sept. 7	M.	22	Queen's Road	„ 10	Died	{ Confluent & hæmorrhc. }	{ Died { Sept. 17 }	{ Two very imperfect marks. }
„ 11	F.	60	Small-pox Hosp.	„ 14	Oct. 1	{ Very modified }	Recovered	{ Three very indistinct marks. }
„ 21	M.	33	{ St. Leonard's Terrace, Northgt. }	Went to	Carlton	Severe	Died	Unvaccinated.
„ 23	F.	11	Chatham Street	Sept. 26	Oct. 20	Mild	Recovered	Two imperfect marks.
„ 30	M.	32	{ Newnham Road, Northgate }	Oct. 3	Nov. 17	{ Semi- confluent }	„	{ Two very imperfect marks. }

Cases at Balderton, in Newark Rural Sanitary District.

Date.	Sex.	Age.	Residence.	Admitted to Cottage Hosp.	Dischd. from Cottage Hosp.	Character of Disease.	Result.	Vaccination.
Aug. 3	F.	15	Balderton	Aug. 14	Sept. 24	Severe	Recovered	Vaccinated One mark.
„ 21	M.	18	Balderton	Aug. 25	„ 24	Mild	„	{ Vaccinated in four places about the time of infection.
„ 24	F.	—	Balderton	In hosp.	„ 24	Very mild	„	

Cases at Ruskington Urban Sanitary District, near Sleaford.

Date.	Sex.	Age.	Residence.	Admitted to Tent.	Dischd. from Tent.	Character of Disease.	Result.	Vaccination.
Aug. 26	M.	24½	Lincoln St. Northgate, Newark	Sept. 4	Sept. 29	Mild	Recovered	Two Marks.
Sept. 9	M.	55	Ruskington	In tent	Oct. 16	{ Very modified }	„	Inoculated.
„ 11	F.	53	Ruskington	In tent	„ 16	Severe	„	One mark.

Towards the end of the outbreak there were three very mild cases of disease in one house, and since there were some doubts as to the character of them, it was deemed the safer plan to send the cases of the children all to the hospital with their mother, until they had quite recovered, rather than run the least risk of starting the disease afresh in a new neighbourhood. They are not included in the foregoing table.

I have put the Balderton and Ruskington cases together with the Newark ones, because in each case the disease was contracted in the first instance at Newark, and therefore they properly belong to this outbreak.

I heard from the Medical Officer of Health of York that a man had small-pox in that city, and that just twelve days before he was taken ill he had slept at the “Ship” public-house, Water Lane, Newark, where there were two fatal cases of the disease.

The Medical Officer of Health of Bradford (Yorkshire) also informed me that a man suffering from small-pox was removed into the fever hospital there, and that he stated that he had slept at a common lodging-house at Newark just twelve days before he was taken ill, but he was not able to elicit from him the address where he stopped.

I also heard of a man at Melton Mowbray and of another at Leicester who had taken the infection of small-pox at Newark.

I have not tabulated these cases, as I do not possess the particulars of them.

The following table shows the number of cases which began in each week between the appearance of the first one and the time when the temporary hospital was finally closed. It was opened on August 9th, and was shut up on November 24th:—

Seven Days.			Fresh Cases.	
April 20	to	April 26	...	1
„ 27	„	May 3	...	0
May 4	„	„ 10	...	0
„ 11	„	„ 17	...	0
„ 18	„	„ 24	...	0
„ 25	„	„ 31	...	0
June 1	„	June 7	...	1
„ 8	„	„ 14	...	0
„ 15	„	„ 21	...	4
„ 22	„	„ 28	...	0
„ 29	„	July 5	...	0
July 6	„	„ 12	...	2
„ 13	„	„ 19	...	2
„ 20	„	„ 26	...	2
„ 27	„	Aug. 2	...	8
Aug. 3	„	„ 9 (Hospital opened)	...	30
„ 10	„	„ 16	...	5
„ 17	„	„ 23	...	3
„ 24	„	„ 30	...	3
„ 31	„	Sept. 6	...	1
Sept. 7	„	„ 13	...	1
„ 14	„	„ 20	...	1
„ 21	„	„ 27	...	1
„ 28	„	Oct. 4	...	1
Oct. 5	„	„ 11	...	0
„ 12	„	„ 18	...	1 (doubtful)
„ 19	„	„ 25	...	0
„ 26	„	Nov. 1	...	2 (doubtful)
Nov. 2	„	„ 8	...	0
„ 9	„	„ 15	...	0
„ 16	„	„ 24 (Hospital closed)	...	0

I think it is quite possible that some of the cases put down as beginning between August 3rd and August 9th may really have begun in the previous week, but I ascertained the actual date of the commencement of the cases as nearly as I was able. The interval which elapsed between the first and

second cases shows that if we had received early information of the former, and had been prepared to isolate it immediately, there need have been no other cases whatever. The same remark applies to the interval between the next four cases (all of which occurred in one house and were directly caused by the second case) and the subsequent ones. Until the hospital was opened and sufficient time had elapsed for isolation of the sick to control the spread of disease, cases were occurring with increasing frequency in fresh houses and in new localities. The numbers then kept up for three weeks, the majority of those cases having received the infection before the opening of the hospital, since the period of incubation is about twelve days; but when all the cases had been removed into the hospital the prevalence of the disease began to diminish, only one fresh case occurring in each succeeding week until the outbreak finally ceased about eight weeks after the hospital was opened.

There can be no doubt that the isolation of the cases in the hospital greatly checked the outbreak, and was at last successful in stopping it altogether. I feel sure that it would have assumed more serious dimensions if the hospital had not been erected.

There were sixty-six cases of small-pox in the town, excluding those which took the infection in Newark and went right away, but including the man who went to Carlton and the woman who went to Southwell.

Thirty-eight of these were admitted into the hospital exclusive of the three doubtful ones. Including those at Balderton and Ruskington, which arose from this outbreak, the number of cases amounts to seventy-two. Fourteen of them ended fatally, so that the total mortality was at the rate of 19·44 deaths out of every 100 persons attacked. Twelve of the deaths took place in the borough—six in the hospital and six in the town.

I was unable to ascertain whether the woman who went to Southwell and died there had ever been vaccinated, so I am obliged to leave that death out of the following calculations.

Two of the patients had been inoculated with small-pox matter when young. They both recovered. One of them had the disease very slightly, whilst the other had it very severely (confluent), and nearly died from it. Seventeen of the persons who suffered

had never been vaccinated, and ten of them died. So that the mortality amongst unvaccinated persons was at the rate of 58·82 out of every 100 persons attacked.

Fifty-two persons who had the disease had been vaccinated, but never re-vaccinated. Of these only three died, so that the mortality amongst vaccinated persons was at the rate of only 5·77 out of every 100 attacked, instead of 58·82 as happened amongst unvaccinated persons. But not either of the three vaccinated persons who died had ever been efficiently vaccinated, for one of them had but two vaccination marks, another two very imperfect ones, and the other had only one, and, as remarked above, they had never been re-vaccinated.

Every person should have at least four, and preferably five or six, good vaccination marks produced in infancy, and should be re-vaccinated successfully when about twelve or fourteen years of age. This produces almost absolute immunity from the disease, and entirely prevents death from it. If this were done in every case we should soon hear no more of small-pox. It is to the absence of vaccination, or to inefficient vaccination that the periodical recurrence of the disease is due.

We may draw the following deductions from the foregoing facts, which show the control which efficient vaccination exercises over this loathsome disease.

1. Re-vaccinated persons did not suffer from small-pox at all.
2. No death, or even case, occurred amongst persons who had been really effectually vaccinated.

3. The cases which occurred amongst persons who had been vaccinated, but not re-vaccinated, varied in severity according to the degree of efficiency with which vaccination had been performed, the severer cases having been amongst those having only one or two marks. Three out of thirteen deaths took place amongst such.

4. Unvaccinated persons had the disease in its severest form, ten out of thirteen deaths having occurred amongst them.

The period of incubation in small-pox was fixed very definitely in several instances during this outbreak.

The woman who was the second to have the disease left the common lodging-house, where she was stopping, and went to a house in Tallent's Row on June 5th. On June 16th three of

the inmates of that house, and on June 17th another of them began to be ill with small-pox.

The man who died at Carlton left Newark, and remained away a fortnight. He returned and went to an infected house there on September 9th, and took some clothes from another house where there had been a case. He began to feel ill just twelve days afterwards, on September 21st.

A woman who had been nursing at the small-pox hospital left it, and went to her home in Newark on September 11th. On September 23rd her daughter, living in the same house, began to be ill with the disease.

There were no other cases in that part of the town, and it was afterwards ascertained that the woman had given up only a portion of her things to be disinfected before leaving the hospital. There can be no reasonable doubt that the infection was conveyed to her daughter in her clothes.

The following is a very pretty instance of the power which vaccination possesses of modifying the severity of small-pox.

An unvaccinated girl died from very severe confluent small-pox in Tallent's Row. Her brother, aged fifteen, had never been vaccinated, and was with his sister a great deal during her illness. However, he was persuaded to get vaccinated, and this was done in four places on July 17th. All the places took beautifully; it was a typical case of primary vaccination. On July 25th he began to be ill with small-pox, the eruption appearing on July 28th. But instead of his having the severe confluent form, like his sister had, his was a typical case of discrete small-pox, all the pustules being isolated, and not confluent in any part of his body. Now the period of incubation is twelve days, so that the boy must have taken the infection about July 13th, that is to say about four days before he was vaccinated. Although the vaccination was too late to prevent the disease altogether, yet vaccinia ran its course in his system concurrently with small-pox, and had the effect of very greatly moderating its severity. If he had not been vaccinated when he was, the chances were that he would have died, judging from the rate of mortality in unvaccinated cases which ruled in this outbreak, so that in all probability his life was saved by his having been vaccinated just in time; at any rate we may be

quite sure that the severity of the disease was very much mitigated thereby.

All the houses where small-pox occurred were very thoroughly disinfected, a man being employed by the authority to do the work, so as to insure its being effectually done. As there is no disinfecting apparatus in the town, all infected beds and other things had to be burnt and replaced at the expense of the rates. In fatal cases carbolic powder was put into the coffins, and the bodies were buried on the day of death or on the day after.

A man was employed by the authority to take medicines, &c., to the patients in the town so as to prevent persons going to the dispensary from infected houses, where they would be very liable to convey infection to others.

Vagrants were not allowed to go to their usual common lodging-house in Water Lane, because they would have been very liable to have contracted the disease there, and then carry it to other parts of the country. They were lodged in the old workhouse wards. Proper vagrant wards in the town have since been completed.

I advised that the schools should be kept closed until the disease had disappeared, and they were not re-opened until the outbreak had ceased.

I suggested to the Guardians, who have the control of vaccination, that it would very much tend to prevent the spread of small-pox if a house to house visitation were made for the purpose of discovering unvaccinated persons, and of urging the necessity of adults having themselves re-vaccinated; and that it would be advantageous if the vaccination officer were empowered, for the time being, to take immediate proceedings against defaulters, without having to wait for a meeting of the Board to be authorised to do so. The latter suggestion was acted upon, but the former was not.

The Sanitary Inspector received information from the clerk to the Ely Rural Sanitary Authority that a man whose wife had died from small-pox was going to a place in that district with some members of his family from Newark. He was found at the station with a number of beds, clothes, &c., placed on a truck ready for sending. The things were seized, and those which could not be disinfected were burnt and replaced. They must

all have been full of infection, and if they had been sent they would in all probability have started the disease in a fresh place.

The man was summoned for exposing the infected articles. He was fined 1s. and costs.

I have already stated briefly the general arrangement of the temporary hospital. All the tents were procured at Messrs. Piggott Brothers in Bishopsgate Street. They are excellently made, and I can speak in the highest terms of the usefulness both of the Radcliffe Tents and of the Hospital Marquees when the weather is not too cold. They are lined, are very warm, and are proof against the heaviest showers of rain.

Each of them was trenched round, and had a good wooden floor, raised on bricks. They were warmed by paraffin stoves, which were protected by a fixed wire-guard, so that they could not be knocked over. Buckets were kept constantly filled with water in them as well as in the building, for immediate use in case of fire.

The Radcliffe Tents measure 16 feet by 14 wide, and are 13 feet high to the ridge. Their superficial space is 224 feet, and their cubic contents 1,850; so that they each served for two patients.

The Hospital Marquees are 30 feet long by 16 feet wide, and are 7 feet high at the sides. They contain 400 superficial, and 3,800 cubic feet of space. They each served for four acute cases, or six convalescent patients.

The tents after the hospital was closed were disinfected and stored away in casks which I had made for the purpose.

The main wooden building was built chiefly in accordance with the Official Memorandum of the Local Government Board on Hospital Accommodation, to be given by Local Authorities (*Memoranda for Local Arrangements for Infectious Disease*, No. I.), with the exception of the lining, which was unfortunately made of lath and plaster instead of wood.

It is divided into two wards, each measuring 23' 6" long by 21' 6" wide. They are 8' high at the sides, and 14' 9" to the ridge. They contain 505 superficial, and 7,430 cubic feet of space. With four beds in them, that allows about 126 superficial,

and 1,857 cubic feet per patient. During part of the time there were six beds in each ward, and then each patient had 84 superficial, and 1,238 cubic feet. They are warmed by stoves placed in their centres, with the pipes going through the roof. They are ventilated by openings in the ridge, and at the top of the walls. The latter, communicating with the space between the inner and outer linings, are protected on the inside by wooden hoppers. The ventilation is also assisted by sash windows, and Hinckes-Bird's method of admitting air through them was also made use of. Tub closets were used, dry earth was put into them, and their contents were taken away every day to be trenched into the ground. The building is trenched round, its floor being raised from the ground. It includes a dispensary and store-room in one, a bath-room, a nurse's room, and a store for blankets, &c., over the passages. The internal dimensions of the kitchen are 11' 7" \times 11' 7". Height at sides 7' 4". Height to ridge 10' 4". Those of the washhouse are 16' 3" \times 12'. Height at sides 7' 4". Height to ridge 11' 11". In the same building as the kitchen there are two store-rooms and a housemaid's closet.

Each compartment of the double wooden hut has 142 superficial, and 1,358 cubic feet. Its height at the sides is 7' 2" and to the ridge 11' 11".

The single wooden hut contains 800 cubic feet. It was bought ready made from Messrs. Lascelles, Bunhill Row, and was put up in three-quarters of an hour from the time it was first got on to the ground. In addition to the above described buildings there is a lamp-room, where oil was stored in safety, and the lamps trimmed; also a wooden structure for a mortuary, and some tub closets. Posts for paraffin lamps were placed about the grounds so as to give sufficient light at night. Good gravel roads and paths were made, in order that the convalescents could walk about in the day. No pure water could be obtained on the ground, consequently it had to be led from the town in a cart once or twice a day.

All slop water was disposed of in a harmless manner by a Field's flush tank, which emptied itself into a well-jointed sanitary pipe drain, which delivered the water on to a piece of under-drained ground, some distance from the buildings, on which cabbages were planted. The ground is very flat, and

there was consequently great difficulty in getting sufficient fall; but though placed under unfavourable circumstances, the plan answered its purpose very well.

There was no communication with the town by means of any of the residents at the hospital. A man was employed to go there twice a day for provisions, &c.

Through the liberality of a gentleman in Newark, quoits and a bowling alley were provided for the use of the convalescents. They were greatly appreciated by them.

At one time or other fifteen nurses, servants, and attendants were employed. Five of them were taken on after they had recovered from an attack of small-pox. One had had the disease previously. All the rest, with the exception of one, were, or had been previously, re-vaccinated. For some reason or other the re-vaccination of one nurse was overlooked. She took small-pox, but had the disease in a very mild and modified form. She had been vaccinated in infancy, and had three indistinct marks.

The total expenses incurred were as follows:—

			£	s.	d.
Construction of Hospital and Furnishing	...	...	868	4	6
Maintenance	...	...	176	17	9
Salaries	...	...	259	5	4
Total	...	...	£1,304	7	7

The rateable value of the property assessable was £38,000, necessitating a rate of $8\frac{1}{2}d.$ in the £.

This hospital has again proved of eminent service during the present year.

Scarlatina was taken to a family living in a populous part of the town by a woman who had been nursing a case of that disease in a neighbouring village. Two of the daughters took the infection. The father and all five of his children were removed to the hospital, and during the time they were there, a girl who was suffering from the fever was sent in from another part of the town. No other case occurred in the neighbourhood of either of the houses.

The hospital was also, in all probability, the means of preventing a fresh outbreak of small-pox.

On March 20th, a man who was living in a crowded yard in the town was taken ill. The characteristic eruption of small-pox appeared on the 24th, and he was taken to the hospital on the 27th. His wife, the only other occupant of the house, went with him.

There were no other cases of the disease in the town.¹

The history of the cases of small-pox at Balderton is as follows :—

The village is situated about a mile and three-quarters from Newark, in the rural sanitary district of Newark, and contains about 1,000 inhabitants.

A girl, aged fifteen, who was living with her parents there, was attacked with the disease on August 3rd. On July 25th she had been to Newark market, and was in all probability exposed to the infection there, as the disease was prevalent in the town at that time, and she stated that she had not been anywhere else for some time.

She was vaccinated when a child, but had never been re-vaccinated. She had a rather severe attack, but ultimately recovered.

Eight persons occupied the house she was living in, and there are only two bed-rooms in it.

There are eight fully occupied cottages in the row, none of them having back entrances, consequently they cannot be well ventilated. There was every facility for the disease to spread under such circumstances.

I reported the occurrence to the Sanitary Authority as soon as it came to my knowledge. A special meeting of the committee was called at which I advised that an empty cottage should be taken, if one could be found, and, in default of

¹ Mr. Lowther, who was residing at the hospital, elicited the following facts from the man and his wife. His mother was a night nurse at the Hampstead Small-pox Hospital. On March 8th he received a coat from her: this was just twelve days before his illness commenced. I ascertained that the woman stated that she bought the coat at a shop, kept it wrapped up in her sleeping apartment, and sent it to Newark by train the next day. The period which elapsed between the receipt of the coat and the commencement of the man's illness points with great suspicion to it as being the medium by which the infection was conveyed, and the more so since neither before nor after that time were there any other cases of the disease in the town, nor had the man been to any place where he was likely to have contracted it.

this, that a tent should be bought to place the case in. It was resolved that this should be done. An empty cottage was found half a mile from the village, the consent of the owner was obtained, and the place was put into thorough repair and furnished by the Sanitary Authority. It was not ready for occupation until August 14th. The girl was admitted into it on the evening of that day.

A man and his wife from the village were engaged to take care of the place and nurse the patient. They had to close their own home, so they took their son, a lad of about twelve years of age, with them to the cottage hospital.

The man and boy bore evidence of having been vaccinated, but I could find no trace of any marks on the woman. However, I vaccinated them all three on the morning of August 14th, before the case of small-pox was sent in. As the woman had never been done before I vaccinated her very thoroughly in four places, using a separate point for each place, and four typical vesicles formed. The vaccination of the man and boy also took.

About August 24th or 25th the woman began to be ill, that is to say about eleven days after she was vaccinated, and had a very slight attack of small-pox. She only had a few scattered pustules, and soon recovered.

Thus it was evident that she took the infection of the disease at nearly the same time as she was vaccinated. Vaccinia and small-pox ran their course together in her system, the disease being extremely modified by the vaccination.

We had considerable difficulty in getting any one to take charge of the cottage hospital, and it was only just at last that we induced these people to undertake to do it. If it had not been so I should not have run the risk of engaging the woman until she had been fully protected by vaccination, and as it was I refused to allow them to remain unless they were all vaccinated before the case of small-pox was admitted.

On August 25th the brother of the first patient was sent into the cottage hospital suffering from small-pox. He had been living in the same house as his sister. He has one vaccination mark, and had not been re-vaccinated. He had the disease rather severely, but recovered from it.

The inmates were all discharged and the cottage was closed on September 24th. I kept them in rather longer than I otherwise should have done, so as to wait till after Balderton Feast. I considered it desirable to do so because there is no place for disinfecting clothes that will not wash, and accordingly I could not satisfy myself that they would leave the hospital entirely free from all infection, and if they had retained any infection they would have been especially liable to have communicated the disease to others during the feast week, as so many people congregate together at this time from different parts of the country. The medical officer of the workhouse was engaged to undertake the medical charge of the patients.

Everything that could be steeped in a disinfecting fluid was disinfected by that means, the beds were burnt, and when the cottage was unoccupied it was well disinfected.

I think there can be but little doubt that the disease would have spread further in the village if these cases had not been isolated, for there would have been at least two cases at the same time in a small, fully-occupied cottage, where good ventilation could not be insured, in close proximity to other cottages similarly circumstanced.

The cases at Ruskington arose in the following way:—

A man, aged twenty-four, was living at Lincoln Street, Newark, near to a part of the town where there were many cases of the disease. On August 26th he was suffering from a carbuncle. He felt ill, so he went to his father's cottage at Ruskington. This is a village of about 1,156 inhabitants. It is situated three and a half miles north-east from Sleaford, and constitutes a small urban sanitary district in the midst of the Sleaford Rural Sanitary District.

On August 27th the doctor who attended him found that he had all the premonitory symptoms of small-pox. I saw the case with the medical attendant on the 29th, and there was then every reason to believe that the patient had the disease. The eruption appeared on the 30th. The attack was severe, but not fatal. The patient had only two moderately good vaccination marks, and had never been re-vaccinated, therefore he was by no means sufficiently protected by vaccination. He was lying in a very small, ill-ventilated bed-room in a cottage

situated in the middle of the village, which was also occupied by his father, mother, brother, and sister. The cottage had two other bed-rooms, but it was impossible to isolate him effectually there.

The others were vaccinated as soon as possible, the parents unsuccessfully. As soon as it was certain that the man had small-pox, I got a special meeting of the Sanitary Authority called, and advised that, as he could not be effectually isolated in his home, an empty cottage away from other houses should be taken to put him in if such a one could be found; but if not, that a Radcliffe Hospital Tent should be procured at once for him to go into.

This step appeared highly necessary, because the house is in the middle of the village, and it did not admit of the patient being kept separate from the rest of the inmates; consequently if he had remained in it there would have been great probability of the disease spreading to many of those in the village who might be susceptible of taking its infection.

I also advised that his parents should go with him to take care of him, and that they should be remunerated for so doing, since the authority, having undertaken the charge of the case, was bound to take proper care of it.

These proposals were agreed to, and it was left to the chairman of the authority and myself to make the best provision we could. Accordingly we visited the only three empty cottages we could hear of in the neighbourhood, but we found that they were all either inconveniently situated or were not in a habitable condition, so we decided that the only thing to be done was to order a tent. This arrived on the morning of September 4th. One of the members of the authority kindly allowed it to be pitched in a grass field of his just outside the village. A wooden floor, raised on bricks, was put in it, and it was trenched all round.

A small wooden structure with an American cooking-stove and brick chimney was put up to serve as a kitchen, &c., and a tub closet was provided behind this.

No drainage was required, as there was ample space for all the slops to be disposed of on different parts of the field. The drinking water was fetched from a rivulet at the further end of

the field, and arrangements were made for the daily supplies to be taken and left at the entrance to the field, so that the inmates of the tent were kept from communicating with the village in any way.

The man and his parents were got in the same day as the tent arrived.

On September 9th, five days after going into the tent, the father began to be ill, and had a very modified attack of small-pox. He was not vaccinated in infancy, but was inoculated with small-pox matter when between four and five years of age. He said he distinctly remembers having a good rash out at that time, about fifty years ago. He was vaccinated on September 1st, but, as mentioned before, it was not successful.

The mother was vaccinated in infancy; she has only one mark. She also was re-vaccinated unsuccessfully on September 1st. On the 11th she was taken ill with small-pox, and had a very sharp attack, but eventually recovered.

The period of incubation in small-pox being twelve days, it is evident that both the parents had received the infection of the disease before they left their home to go into the tent, and before it was attempted to vaccinate them.

The son left the tent in an entirely fresh suit of clothes, and returned to Newark on September 29th, and the parents went back to the village on October 16th. Disinfection was thoroughly carried out. The things that could not be disinfected were destroyed, and compensation was given for them by the Sanitary Authority.

No other cases occurred in the village. The fact of the parents catching the disease while they were still in their own home is a proof of the desirability of providing a place for isolating the case of small-pox as soon as possible after arrival in the village. If this had not been done there would have been three cases of the disease at the same time in a small cottage in the middle of the village. The infection would then have been highly concentrated, and would have been under the most favourable circumstances for spreading.

I cannot but believe that the prompt action taken by the Sanitary Authority saved the village from a great calamity. The cost incurred was serious for so small a place, but it would

have been greater if the disease had got a hold upon the place, and what would have been far worse, many deaths and much suffering might have been caused.

So long as there is no permanent provision made for dealing with these outbreaks of disease it often happens that some temporary arrangement has to be got up in a hurry, which is always a more or less costly proceeding.

It would be far better if neighbouring sanitary authorities would combine and make a moderate permanent provision for isolating cases of infectious diseases, and, in conjunction with that, provide suitable places for disinfection.

THE PRACTITIONER.

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Original Communications.

CHAULMÚGRA OIL IN THE TREATMENT OF LEPROSY.

BY DAVID YOUNG, M.D., FLORENCE.

CHAULMÚGRA Oil is a fixed oil obtained from the seeds of the *Gynocardia Odorata*, one of the *Bixineæ*, found in the forests of Eastern India. From time immemorial it has been held in great esteem by the native races of India as a potent remedy in the treatment of leprosy, and interesting notices of the oil in its relation to this disease are found in several of the Hindu works on *Materia Medica*. About eight years ago public attention was directed to the subject in Western India, in consequence of several cases of reported cure under the care of Dr. Bhau Daji, a graduate of the G. M. C. Bombay. The native press gave prominence to these reports, and the result was that a great many lepers came—some from very long distances—to Bombay for the purpose of consulting him. However, the fees he demanded were exorbitant, and the discovery being soon made that his treatment was mainly a revival of that practised by the *Hakims* centuries before, that his fame was short-lived, though longer than it deserved. A number of the lepers who had been attracted to Bombay by Dr. Bhau Daji's fame applied at the Mission hospital for relief, and in the course of eighteen months

between fifty and sixty cases were treated with the chaulmúgra oil. During this period my attention was directed to a leguminous plant, the *Psoralea Corylifolia*, which abounds in the Konkan and Deccan, and was said to be much used by lepers as an external application, in combination with oil. While investigating this I discovered that the seeds of the plant were well known to Hindu ladies, and were much used as a remedy in *loss of hair*.

The following notes include cases treated simply with chaulmúgra, and others treated with chaulmúgra and psoralea.

The forms of the disease noted were :—

Macular Leprosy, 4.

Anæsthetic Leprosy, 23.

Tubercular Leprosy, 15.

Mixed cases, 11.

The patients were all adults, and the proportion of males to females was about 3 to 1.

ILLUSTRATIVE CASES.

1. ATM., aged 37. Bullock driver. Patient states that he first became ill seven months ago. During that time he had three attacks of fever, accompanied by an eruption of blotches, which were painful to the touch. The blotches nearly all passed away after the first two attacks, but the last had remained little altered. The spots varied in size from a crown-piece to a six-pence, and were about fifteen in number. They occupied the outer aspects of the arms and legs, lobes of both ears, and one large patch extended from the ear to the chin, involving the cheek and left ala of the nose. The centre of the spots was very pale and dry-looking, the margins slightly raised and of a coffee colour. The hairs on the smaller spots were atrophied but not blanched, while the larger spots were quite bald. Sensation was diminished on the large spot which involved the left side of the face. Father was a leper.

2. ESH., aged 24. Coolie. Case similar to above, no reliable family history. Large and small patches, about eighteen in number, on arms, legs, ears, nose, forehead and chin. One spot

on outside of leg somewhat numb, also one on helix of ear. Over the others sensation was fairly normal. Eyebrows almost totally gone. Hairs on and around patches gone or atrophied. Has been ill twelve months.

3. BAP., aged 49. Native of Poona, servant. Has been ill for two years; disease began by shivering, followed by fever and an eruption of large blotches which appeared on the face and forearms. The blotches never completely disappeared, but many of them increased in size, while new ones continued to come till the whole body was affected. About a year ago he discovered that he could not grasp any object with the left hand without suffering great pain. The whole hand as far as the wrist was numb, but became very painful on making an attempt to grasp any object. On examination, large coffee-coloured spots were seen on the back, mammae, thighs, legs and arms. The face was much disfigured by several large shiny patches with raised edges; the lobes of the ears were thickened and painful. The *centres* of all the patches were quite benumbed. No tenderness except in the lobes of the ears or when the hands were firmly grasped. Hairs in mammary region atrophied and some parts completely bare; the hair follicles on close examination were found to be distended, the eyebrows were quite bald, as were also numerous patches in various parts of the body. The fingers of the left hand had a shrivelled look, and the middle, ring, and little fingers were atrophied. Several large bullæ had appeared on this hand six months before.

4. RUN., aged 28. Sweeper. Was seized three years ago with severe shooting pains in one foot which prevented him from walking, and was thought to be rheumatism. This was followed by a feverish attack and then several large bullæ appeared on the face and legs. These dried up and left behind whitish spots. The spots on the thighs where the blebs had been were darker than those on the face. With the exception of these spots there were no other discolorations seen. There were no hairs on the eyebrows and face; and the hands, forearms and legs were quite bald. The hands and feet were cold and benumbed, but occasionally the same severe shooting pains which ushered in the attack were felt in the fingers and toes. There was almost complete anæsthesia of the hands, forearms,

feet, forehead and lobes of the ears, although the skin wore a natural and healthy appearance. A year ago the ears were very painful, now they are perfectly benumbed.

5. MAH., aged 47. Merchant. Has been a leper for four years. Patient's attention was first directed to the disease in consequence of slight swelling and tingling in the lobes of the ears and right side of nose. Shortly afterwards the hair fell off the eyebrows and cheeks, and about the same time patient discovered several numb spots on the nates and thighs. About two years ago these numb spots became the seat of numerous large bullæ, which soon broke and never dried.

On admission numb patches were found all over the body, those on the face being the worst. On the nates and thighs were a number of unhealthy ulcerous sores, the remains of the bullæ. The palmar surfaces were shrivelled and of a dark red colour. The index and middle fingers of the right hand were permanently flexed, and the left hand was numb and weak. The soles of both feet were the seat of characteristic leprous sores. There were seven on the left and four on the right foot. Superficially the ulcer was circular, and as it entered the tissues it gradually narrowed so as to form a cone, the apex of which went as far as the tarsal and metatarsal bones. In some of the openings the probe penetrated almost to the skin on the dorsum of the foot! Numerous maggots were moving about in the sores.

6. R. M., aged 51. Soldier; Irish. Has lived in India twenty-seven years. Has been a leper seven years. Can give no account of first appearance of disease. Has been stationed at several places where lepers came about the camp, but beyond a casual meeting had no relations with them whatever. After an attack of fever he observed some red swellings on the side of the nose and forehead, and one or two on the inside of the left knee. Gradually they increased until the whole body was more or less covered, especially the extremities and the face. There were no spots on the trunk for two years from beginning of attack. On admission there were large tubercular masses seen upon the back of the hands, feet, legs, hips, cheeks, ears, nose, and forehead, and several along the spine and over the ribs. There were no hairs on the eyebrows or cheeks, and very few

stunted ones on the limbs and trunk. The tubercular spots in some places were tender on pressure, but there was anæsthesia of the others, as also of the surfaces between the patches. So complete was the anæsthesia of the feet that two days before the patient was admitted he was aroused about midnight by a noise in his room, and found on lighting a candle, several large spots of blood in the bed. The toes of his right foot were still bleeding, and the poor fellow made the further discovery that the distal phalanges of three of his toes had been nibbled away by rats!

REMARKS ON FOREGOING, CASES.

The *first* and *second* are pretty well marked examples of macular leprosy, the *third* is a good specimen of the anæsthetic form, developing out of the macular variety, while the *fourth* began with and maintained throughout the anæsthetic type. The *fifth* is also an example of anæsthetic leprosy, complicated by ulcerous sores, the remains of unhealed bullæ and the conical ulcer so frequently seen in this form of the disease, and the *last* is a case of tubercular leprosy, presenting well-marked anæsthetic symptoms.

TREATMENT.—The two drugs employed were the chaulmúgra oil and seeds, and a preparation of the seeds of psoralea corylifolia. The chaulmúgra oil usually found in the bazaars being very impure, supplies of the purest oil were obtained from Calcutta. A tincture of psoralea was prepared by macerating ten drachms of the seeds in a pint of rectified spirit, and a liniment by adding a drachm of the tincture to an ounce of chaulmúgra oil.

First Case.—Treatment commenced April 17th. Twenty drops of the chaulmúgra oil were given three times a day, and the affected parts were rubbed with the oil morning and evening.

On April 19th patient complained of great nausea. The dose of the oil was reduced to ten minims, but with no diminution of the sickness.

On April 21st he began to take five drops three times a day, and continued for a month without any feeling of sickness. The dose was gradually increased until at the end of three months he was taking fifteen drops three times daily.

After four months steady treatment a marked improvement began to show itself. The blotches gradually lost their raised margins and the "centres" lost their pale dry appearance and assumed a healthy look. There was more "feeling," as the patient expressed it, in the large patch on the left side of the face, and in ten months from the beginning of the treatment the face was almost natural. The large blotch was nearly gone, and except in one little spot on the ala of the nose sensation was quite restored. Patient gained 4 lbs. in flesh. On the restored parts a few sickly-looking hairs had appeared.

Second.—Treatment begun April 24th. Twenty drops of chaulmúgra with ten of tincture of psoralea were given three times a day. On April 28th patient complained of sickness. He had vomited the last two or three doses of the medicine. Six drops of the oil with six of the tincture were now given, and this the patient bore well, and continued for about six weeks when it was increased to ten drops of each, and so gradually on till the dose was twenty drops. From the commencement he used the liniment of the oil and psoralea. This patient improved more rapidly than the previous one. In three months from the beginning of the treatment the spots had undergone a considerable change, and the eyebrows were almost natural, while the hairs on the other parts of the body were numerous and strong. In October—that is six months from his admission—he returned to his country, having meanwhile gained seven pounds in flesh with the spots almost completely gone. Sensation quite restored in the patch on the leg and helix of ear.

Third.—Began to take five minims of the chaulmúgra oil three times a day on 4th of May, and at same time to use the liniment of the oil and psoralea. Continued for two months without any nausea. The dose was slowly increased to fifteen doses of each. Improvement was very tardy, first showing itself by the patient being able to grasp objects with less pain than formerly. The coffee-coloured spots gradually paled and several of them entirely disappeared. The numbness in the *centres* of the spots diminished, but never completely went, and no apparent change took place in the shiny spots, save a slight thinning of their raised edges. No perceptible change took

place in the shrivelled contracted fingers of the left hand. The lobes of the ears became less painful, but lost none of their thickness. The eyebrows were well covered with strong dark hairs and in all the bare spots there were vigorous growths of healthy hair. No note of weight.

Fourth.—*RUN.* commenced taking ten drops of the oil on 21st May. After four days he complained of pain in stomach and sickness. The dose was reduced to five drops and the compound liniment was used night and morning. In August the dose was increased to twenty drops, but there was very little improvement. During the first six months he had no return of the attack of pain, but twice had sharp fever which gave way to quinine. The hairs on the eyebrows appeared and also on other parts of the body, but not so healthy and strong as in the other cases. There was no change in the whitish spots, but the dark spots on the thighs became more natural in colour, and in these the hairs were healthy and numerous. Gained five pounds.

Fifth.—Began with five drops of the chaulmúgra which were rapidly increased to twenty. Patient gained flesh, but seemed to derive little or no benefit as regards the leprosy. The superficial sores healed after five months treatment and the use of the compound liniment, but the conical sores remained as they were. The oil was continued for a whole year, and during three months the deep sores in the soles of the feet were dressed with carbolic acid and chaulmúgra (1 in 30). The sores gradually healed and remained so for two years, after which the patient was lost sight of. Beyond this no appreciable improvement could be seen; save a few hairs on the eyebrows no new growth of hair was observable. Gained eleven pounds.

Sixth.—The above treatment was persevered in for nearly nine months, and with the exception of a slight lessening of the tenderness in the tubercular spots there was no apparent benefit whatever.

OBSERVATIONS.—(a) In the macular and in the early stage of the anæsthetic forms of leprosy the chaulmúgra appears to be of decided value.

(b) The oil should be given at the outset in small doses and gradually increased, as otherwise it is apt to cause nausea.

(c) The good results were seen earlier in those cases in which the powdered seeds were given instead of the oil.

(d) A liberal milk diet seemed to be a valuable auxiliary.

(e) The psoralea given internally, in combination with the oil, appeared to be of no value, but when applied externally in the form of a liniment was of undoubted service, especially in stimulating the hair bulbs.

(f) Several of the cases treated were complicated with bronchial affections, which were quite relieved during the treatment. This, taken in connection with the fact that all the patients gained flesh, may point to the probable usefulness of the oil in affections of the chest.

(g) The oil has a deserved reputation in cases of itch and parasitic pediculi, and forms a valuable addition to the ordinary sulphur ointment.

SURFACE THERMOMETRY.

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AFTER ten years of effort, surface thermometry has been sufficiently advanced to yield results of value in the illustration of physiological and pathological processes, and to be of practical service in the diagnosis of disease, in prognosis, and in treatment.

The difficulties that have hitherto withstood progress in the investigation of temperature changes on the various external surfaces of the body were chiefly dependent on the instruments to be used and the mode of using them. These difficulties have at length been satisfactorily overcome.

My first observations on the surface temperature of children, as compared with interior body-temperature, were made by means of a thermometer (Casella, No. 5691) with very fine bulb and long index. The bulb was readily enclosed in a fold of the skin, or in the natural creases of the neck or thigh in thriving children. To many surfaces this bulb was inapplicable, and the length of the index inconvenient. The stem to this small bulb was nine and a half inches long, the graduation, from 90° to 115° , occupied the last three and a half inches only; an instrument of half this length was clearly all that was necessary; but, until Phillips' self-register was applied to clinical thermometers, a long index was required for ready reading at the moment of observation. Some interesting results, published in 1868,¹ were obtained in this way, before the short clinical self-registering

¹ "Infantile Temperatures," *Trans. Obst. Soc. London*, 1869.

thermometer, first made for me by Mr. Hawkesley, was brought into general use.

The need for a good surface thermometer was first clearly foreseen by Dr. Seguin, of New York. This was urged by him in the *New York Medical Record* for January, 1867. In December, 1870, he had still to plead the necessity for such an invention. The next year he himself invented a surface thermometer, figured in *Suggestions on Thermometry and Human Temperature*, New York, 1871. The instrument itself was defective, for mechanical pressure on the thin lower surface of the bulb would cause the index to rise. The rules then laid down I quote as important. The first, "Have at least two of them perfectly alike," is specially so. Next, "Warm them equally about three degrees below zero-health; use no pressure; trust to simple apposition; leave them three minutes *in situ* and read, then two minutes more to make sure that you have attained the pathological difference." In a later work, besides these and further directions,¹ is given (p. 278), the figure of a most simple and effective "Thermoscope," or radiometer, devised in 1875, to show body-heat in the act of escaping (radiation) under the most delicate conditions. It consists of a glass tube with a spherical bulb at one end; the bulb is heated in warm water, and the open end of the tube plunged an inch into cold water. A drop of water runs up the tube and forms the index; when the bulb is held in the closed hand the full temperature will be shown in from ten to fifteen seconds. At the same time Winternitz was contriving, in Vienna, his calorimeter, a double, square, wooden box, covering in the bulb of a thermometer placed on the skin. Hawkesley, in 1871, had covered in the bulb of a thermometer on one side, and so made an instrument useful for taking some local temperature, but not sufficiently sensitive for the purposes of surface thermometry. Dr. Seguin's thermoscope, though exquisitely sensitive and useful for certain purposes, has this great defect, that its indications cannot be reduced to an exact thermometry.

To Dr. Dupré we are indebted for a form of surface thermometer capable of being made at once sensitive and accurate;

¹ Vide *Medical Thermometry and Human Temperature*, by E. Seguin, M.D. New York, 1876, p. 273.

the bulb is coiled in a spiral, and enclosed in a vulcanite or metal cup, arranged either on the same plane or at right angles to the index. A form of this instrument was shown by Dr. Ord, in October, 1876, at the Medico-Chirurgical Society. A description of this is published in vol. lx. of the *Transactions*, together with some valuable remarks by Dr. Ord on the methods and conditions of taking the temperature of the surface of the body. Mr. Hawkesley has quite lately arranged pairs of these, very carefully compared, in a small case, at a moderate price. They will give trustworthy indications with one minute's application, so that no tiresome delay occurs in using them, and the two, ready for use, are now obtainable at what was the cost of one a few months since.

The first of the following series of observations was made with one of the more expensive instruments; all, after the second, were made with two of those instruments, so carefully adjusted that they would read to one-tenth of a degree in two minutes, or in less than a minute with careful precautions.

A useful surface thermometer must have been some time in use on the Continent. Dr. Schumacher, of Aix-la-Chapelle, in 1873-4, based some successful therapeutic indications on a difference of half a degree in the temperature of different parts of the head, in a case of what he well called angio-paralytic megrim, as distinguishing it from the angio-tetanic megrim of Du Bois-Raymond and Brunner.

Dr. Gray, of Brooklyn, records¹ a case of cerebral disease where the temperature over the seat of lesion was 2° Fahr. higher than at other parts of the cranium.

In France, MM. Peter and Vidal² have recently called attention to an increase of from 1° to 2° Fahr., observed over the seat of pulmonary tuberculosis; a difference is sometimes found between two intercostal spaces which may guide to the seat of an hæmoptysis; at least, we have here an additional means of diagnosing the sanious sputa of anæmia and hysteria from a phthisical blood spitting. In chronic tubercular deposit this local elevation of temperature may be wanting, as will hereafter be shown. In phthisis at all its stages the general temperature

¹ *New York Medical Record*, July 13th, 1878.

² *Bull. de l'Académie de Médecine*, September, 1873.

disturbance will always be of first importance ; how frequently the temperature is most elevated in the axilla of the side on which the lung is diseased has been lately noted by Dr. McAlldowie.¹

Dr. Seguin had already mentioned, in the works referred to (p. 274), the use of the surface thermometer in the diagnosis of pleurisy, peritonitis, ovaritis, meningitis, and phthisis ; he there points out that commencing hemiplegia may be shown by a higher temperature on the parts affected, while in an old paralysis the reverse obtains ; and says : “ In certain affections of the brain, not otherwise appreciable, it has shown a higher temperature on one side than the other.” This has been verified by Broca, Brown-Sequard, Dr. E. C. Seguin, and others. Schumacher’s observation confirms Dr. Seguin’s expectation that, in neuralgia, variation of local temperature may throw a new light on the origin of neuroses, and so lead to their mitigation or to their cure.

A true surface temperature differs somewhat, both from a local and from the general temperature ; if the surface thermometer be too long in contact with covered parts of the body something approaching the general temperature is obtained ; thus the temperature of the axilla is a general temperature, and will be almost always, within one degree Fahrenheit of that of the interior of the body.

Local temperatures, as that of paralysed limbs much below the normal, obtained by keeping the thermometer long *in situ*, are not here under consideration, nor the greatly elevated temperatures of some parts, as in Mr. W. Teale’s patient, suffering from local vaso-motor paralysis. Something of this kind probably occurs where the temperature of a surface is affected by the contiguity of a local inflammation or injury ; this may be raised half a degree or more above the temperature of the interior of the body, as in the case at p. 284 (vol. x. *Obst. Soc. Trans.*) in my first paper on “Infantile Temperatures.”

I need not digress here at any length to insist on the exact parallelism always found between the temperature changes observed in young children and those of adults at all ages. My next instance of the importance of the relation of the tempera-

¹ *The Medical Times and Gazette*, September 7th, 1878.

ture of the skin to the processes going on beneath the surface was a case of pleuro-pneumonia in a child between three and four years old; the temperature over the ribs on one side was fully two degrees higher than on the other side; and while the temperature of the axilla on the affected side was as high, and once even higher, than that under the tongue, the other axilla was generally a degree lower. Defervescence occurred suddenly as early as the fifth day of illness, with a very striking increase in the local mischief, as evidenced by dyspnoea and increased area of dulness; pleuritic effusion had taken place, and the surface temperature, though considerably lowered, was still higher than that of the other side. Here the increased temperature of the skin is not owing altogether to contiguity, for the effusion intervenes between it and the inflamed lung. As acting on the skin by fomentations, or a blister, affects the circulation though the internal organs by a reflex influence on their vaso-motor nerve-supply, so may the vascular and functional state of the skin be affected by variations in the state of the organs beneath, or even at a considerable distance. To record this variation is the object of surface thermometry.

Observation I.—Acute Pneumonia simulating Meningitis.—A boy fourteen years old, pale, with family tendency to rickets rather than to tuberculosis; on the evening of Sunday, Sept. 22, has a chill, with fever, intense headache and vomiting all night. Next day the vomiting continues, with deafness and delirium; a dose of calomel acted once freely. Temperature, $103^{\circ}5$; again active delirium at night. 25th. Frequent vomiting; is deaf, drowsy, but not unconscious, pupils act equally to light; is turned to the right with legs drawn up, any movement gives pain. Temperature, 104° . There is no cough; the respiratory movements are much freer on the left side; temperature on the right side, two degrees higher than on the left, approaches that taken under the tongue. Dulness and absence of respiratory sounds over the third rib and space on right front of chest. Frequent as is the concurrence of head symptoms with pneumonia of the right upper lobe, it is rare to find the former so marked, and the latter so limited in extent, as in this instance. The co-existence of this condition of the lung made a favourable prognosis possible, with an expected defervescence on the eighth day.

Till then no further action on the bowels was to be attempted, for nothing so impairs the power of resistance to acute pulmonary disease as purgation; a diet of cream and iced milk was ordered, with ice and cold water to drink. Half a grain of opium was prescribed in pill. During the next two days the symptoms continued; four of the opium pills were taken in all. An improvement was noticeable on the evening of the 28th, and a further examination was made; pulse 110, respiration 36, temperature 103° ; absence of any but tubular breath-sounds over area of dulness, some puerile respiration at spine of scapula, over clavicle, and at nipple, right. 28th. Continuous fall of temperature; some cough and trace of *redux* crepitation over fourth rib; surface thermometer in third space half a degree higher than in second space on the right side, and this one degree more than on the left side. Sunday, 29th. Defervescence complete; after free perspiration and sleep, pulse 80, respiration 30, temperature $98^{\circ}6$; evening temperature $98^{\circ}4$. Tongue clean, appetite returning, bowels acted naturally; no rusty sputa, and not much expectoration. Dulness the same.

From this time rapid progress was made, so that by October 4th, the boy looked well again, and was no longer deaf. Favourable resolution without much expectoration is common in this kind of pneumonia, even when a much larger portion of the lung is implicated; then stimulants, quinine or digitalis, may be required during the course of the disease, with opiate applications externally. Expectorant medicines are seldom required, nor any of the treatment proper either to the first signs of lung implication in the course of acute bronchitis, or to the more extensive congestion of secondary bronchopneumonia.

The physical signs now presented by this boy were—some want of clearness on deep percussion, a few distant harsh sounds on cough or inspiration; superficial resonance and good respiration were restored to the right front of chest, there was no friction; and slightly diminished expansion alone remained to mark the late congestive mischief in the lung; indeed, to those who had not watched the progress of the disease, the physical signs were likely to escape notice. At a thermometric examination on the evening of Oct. 4th the heart's action was weak and irregular

pulse, 72; respiration, 24; temperature, $98^{\circ}9$ *sub linguâ*. Axillary temperature, right, $98^{\circ}2$; left, $97^{\circ}5$. Surface temperature, third space, right, 98° ; left, 97° ; so that a difference of one degree Fahr. is found over the seat of recent morbid action while it is subsiding. It is therefore probable that this method of observation will be found serviceable in detecting the much more important changes at the commencement of disease of the lung.

Observation II.—Recent Pulmonary Tubercle.—A lad, age seventeen years, height 5 ft. 8 in., in good health until last spring, had grown rapidly, three inches last year. Mother tall, healthy. Father had gout at forty-four, now well. An elder brother shorter than he by a head, is strong; three younger ones healthy. Last July, cough and night perspiration began. August, weight reduced to 8 st. 3 lbs; pulse, 120; respiration, 28; temperature, 103° . At left pulmonary apex dulness and deficient breath-sounds. He is ordered to rest and take three grains of quinine at noon. At the same hour in the afternoon of third day, pulse, 100; respiration, 26; temperature, $101^{\circ}5$; after three days without quinine, pulse, 120; respiration, 30; temperature, $103^{\circ}5$. Residence at the sea till October removed all symptoms; he gained weight in the latter part of his stay there, and returned looking well and almost robust, without noticeable cough. The front of the chest has good superficial resonance and return of respiratory sounds; pulse, 120; respiration, 25; temperature, $101^{\circ}5$, in the afternoon; next morning, pulse, 100; respiration, 25; temperature, 97° . Temperature of chest front, second space, right, $94^{\circ}6$; left, $94^{\circ}4$. Third space, right, temperature, 95° ; left, 95° . Back, over supraspinous fossa and between that and upper dorsal vertebræ, temperature, right, $94^{\circ}4$; left, $95^{\circ}4$; or one degree in excess of the corresponding part of the left front, and of both aspects of the right chest. Signs of a small cavity with fine moist rales were heard at this part on the left, also recognisable over the left clavicle. The tongue of this patient was large, red, and somewhat furred on both sides of the dorsum, his appetite was good, bowels regular, and pale cod-liver oil was well taken; still, had it not been for the physical signs, routine practice would have prescribed aperients. The surface thermometer certainly guided here to

the seat of mischief. The longer rest which the general symptoms indicated may lead to the repair of the spot where this recently softened deposit is found.

Observation III.—A young man, aged twenty, height 5 ft. 9 in., weight 9 st. 10 lbs., has noticed streaks and stains of blood in sputa since recent catarrh; also last winter and spring, when he took cod-liver oil, his weight increasing to 10 st. Appetite good, tendency to constipation, tongue clean. Pulse, 72; respiration, 18; temperature, $98^{\circ}4$, afternoon. Chest front, right: temperature, $95^{\circ}4$; left, $95^{\circ}2$. Back apex: temperature, right, $95^{\circ}7$; left, $95^{\circ}6$. Temperature on both sides of head, 94° . The temperature taken at the temples being equal, and all the observations rather subnormal, this case is not clearly connected with those where hæmoptysis accompanies nervous disturbance. The physical signs revealed only anæmic bruit, with a not very perfect expansion of chest on deep inspiration, and suspected weakness of respiration over the left clavicle, but no dulness. Steel, with an aperient containing sulphate of magnesia in the morning, soon removed the coloured sputa. Where this treatment succeeds best there is reason to hope that the symptom is not dependent on tubercular deposit, though this might result from any congestion unrelieved by treatment. In health the temperature of the two sides of the head is often found to vary half a degree, generally in favour of the left side. In certain nervous disturbances the difference is even greater.

Observation IV.—In one patient I have found the temperature vary from $96^{\circ}5$ right, and 94° left, to 96° right, and $96^{\circ}5$ left, with this peculiarity; that on the first occasion the temperature of the right axilla was $97^{\circ}6$, that of the left $98^{\circ}2$, on the second occasion this was reversed, the higher temperature being in the left axilla on the side opposite to the increase of temperature on the temple. I have also this note three days later,—the patient in bed; pulse, 88; respiration, 18; temperature, $99^{\circ}2$; right axilla, $98^{\circ}4$; left axilla $99^{\circ}1$; abdomen right side, $99^{\circ}3$; left, $99^{\circ}2$; right chest front, $95^{\circ}4$; left, $96^{\circ}4$; right temple, $96^{\circ}3$; left, $96^{\circ}4$; later in the day both, 95° . Temperature remaining higher on the left side of the body, while that of the right side of the head was highest, and becoming higher on the right upper part of the body when the left side of the head

first resumed its normal temperature relations, has a significance of its own that may be hereafter dealt with : it is sufficient here to note that a difference of one degree Fahrenheit may be found on the chest when there is no subjacent disease ; there certainly was none in this case.

Observation V.—Quiescent Phthisis without increase of temperature on the affected side.—A lady, age 28, suffered hæmoptysis two years ago with signs of excavation in a region of considerable dulness in the upper lobe of the left lung. In February, 1877, quinine and the air of Margate checked night fever and perspiration ; an excessive muco-purulent expectoration gradually diminished. In May, some increase of cough, with renewed moist crepitant sounds on left front of chest recurred ; since then the symptoms have been, with short exceptions, quiescent. Some blowing cavernous breathing with dulness to the fourth rib exists. October 10th. Pulse 88 ; respiration, 25 ; temperature, $98^{\circ}4$; chest front, right, 97° ; left, $96^{\circ}9$.

Observation VI.—Advanced Phthisis.—A man, age forty-four, ill a year and a half ; hæmoptysis last winter ; very advanced disease on left side, much expectoration, extreme emaciation, and great debility. Pulse, 80 ; respiration, 24 ; temperature, $98^{\circ}4$; right axilla, $97^{\circ}6$; left, $97^{\circ}5$; no increase of temperature on the affected side.

Observation VII.—Acute Phthisis.—A man, twenty-two years old, of healthy family, height, 5 ft. 11 in., nine months an invalid, weight, 9 st. 2 lbs., recently has lost a stone in weight since evening fever and night-sweats began. Signs of increasing cavity in upper lobe of left lung. Noon : Pulse, 92 ; respiration, 30 ; temperature, 100° . Afternoon : Pulse, 120 ; respiration, 40 ; temperature, 103° . Chest front, left, temperature, 101° ; right, $100^{\circ}2$. Axilla, left, temperature, $101^{\circ}8$; right, 101° . The importance of general febrile movement in phthisis cannot be overrated. The febrile accession began in this case very early in the afternoon, perspiration came on in the evening, and a fairly good night followed, possibly with a second slighter accession of fever by early morning. My experience at the Hampstead Hospital, Mount Vernon, affords no single exception to Dr. Pollock's generalisation, that with high fever any improvement, as evidenced by gain of weight, is impossible.

Of antipyretics in tuberculosis quinine in large doses, even to quininism, is the best. This sometimes at once reduces the temperature and effects an improvement that may be permanent, at others it quite fails. Digitalis has little influence. Salicilate of soda is powerless. The mineral acids exert some favourable influence. Hydrobromic acid alone has little effect, either on the fever or on the cough, but is useful in combination with quinine. Morphia not only soothes the cough, but certainly moderates the fever during this stage of rapid waste.

Observation VIII.—Recent Pulmonary Tubercle.—A girl, aged twenty-one, failing health last July, signs of congested lung then noticed, shortness of breath on exertion, rapid pulse and breathing, deficient chest expansion, dulness on right front, respiratory sounds there weak, divided inspiration, expiration prolonged and harsh after cough, anæmic brùit, amenorrhœa of late. Sublingual temperature, $99^{\circ}2$; chest front, right, $97^{\circ}7$; left, $97^{\circ}4$. This slight increase of surface temperature over or near the site of recent tubercular deposit is frequent. During active tubercular mischief in one lung the temperature of the axilla on the affected side is often raised one degree Fahrenheit above that of the other. An exception to this rule is seen in the following instance.

Observation IX.—A young man, a brass tube filer, with small cavity of recent date at left apex. Fine moist rhonchi are heard at third space in front, where slight friction had previously been heard. Pulse, 100; respiration, 40; temperature, $99^{\circ}4$; chest front, right, 98° ; left, $97^{\circ}5$. It is to be noticed that both these readings are high. Possibly some irritating brass filings may be setting up mischief in the right lung, similar to that of which we see the effects in the left; or the presence of lead may cause more general disturbance; it exists in these filings and can produce characteristic effects when inhaled. Here there was a very faint gum line, and tendency to constipation. He has not suffered much loss of flesh. The tongue is clean, but the use of cod-liver oil is temporarily suspended. A young man under observation at the same time, who has raised local temperature over recent lung mischief, is gaining flesh under the use of cod-liver oil, though with furred tongue; says he is very fond of the oil, and consequently continues it. He has no

general-fever, and his tongue is left to clear itself. I have seen a tongue like a blanket cleaned under digitalis in two days.

Observation X.—A young woman, aged twenty-six, a gold-beater, her father died of phthisis; first out of health a year ago; is pale, no sinking under clavicles, chest expansion not quite good, right front slightly less clear on percussion. Well marked anæmic bruit, but no amenorrhœa. Pulse, 88; respiration, 24; temperature, $98^{\circ}2$; chest front, right, temperature, $97^{\circ}8$; left, 97° ; this difference, taken with the family history, gives an importance to the local signs which they would not of themselves demand. She has been taking steel; cod-liver oil, lately rejected, is now taken fairly well by the help of 15℥ of sp. ætheris, as recommended by Dr. Balthazar Foster.

Observation XI.—A girl, aged nineteen, three years ago became out of health; had then well-marked signs of phthisis confined to upper lobe of left lung. Her health has never been restored; loud anæmic bruit in the neck; absolute dulness below the left clavicle, with some blowing sounds and bronchophony. Pulse, 96; respiration, 28; temperature, 100° ; chest front, right, $97^{\circ}4$; left, 97° . The temperature of the surface corresponding to the old pulmonary deposit is here lower than that over the healthy lung. The high general temperature, with a tendency to evening increase, was sufficient to claim for the patient all requisite care.

Our conclusion as to the value of surface thermometry in phthisis from these cases is, that though the surface temperature is not always raised in the neighbourhood of tubercular disease, and that though considerable local elevation of temperature on the chest may be found without such disease existing in the lungs, yet it must be considered an aid of some value both to the diagnosis and treatment of phthisis. The indications afforded by the general temperature and by the other physical signs are far before this one in importance, but it is one that should not be neglected or passed over.

Further opportunities of using the surface thermometer to several patients now under treatment for tubercular disease of the chest afford very uniform results. Where recent active disease exists, there is local elevation of temperature; less recent disease, while undergoing active change, still shows an increase

both of surface-temperature over the site of disease, and of the axilla on the side affected. Where recent deposit is associated with symptoms of local or general improvement, such as diminished region of dulness and increased area of healthy respiration, with subsidence of general temperature to normal, the local temperature also subsides. Signs of old deposit, now quiescent or not producing general disturbance, are often without any evidence of increase, either in surface-temperature, or in that of the axilla of the affected side. A useful means is thus afforded of recognising a subsiding mischief in cases where it would be otherwise difficult to estimate the disease as still progressing, or as likely to be for a time quiescent. Sometimes the axillary temperature is found lower on the side where are signs of old pulmonary lesion; or, the higher temperature may indicate commencing implication of the other lung. With pleurisy and recent pleuritic adhesions, the surface-temperature is raised more than when these complications are absent.

Acute pleurisy may raise the surface-temperature by 4° or even 5° Fahr. The affected side is always a full degree higher than the one unaffected. Besides subsidence of the general temperature on the occurrence of effusion as before mentioned, the surface-temperature lowers but continues markedly above that of the other side until effusion is completed, the difference then becomes less, and gets gradually lower as the effusion is absorbed. Professor Peter, *Bull. de l'Académie de Méd.*, April 1878, shows that paracentesis always causes a rise of local temperature at first, which subsides in twenty-four hours unless more fluid is formed. In diagnosing the slighter forms of pleurisy surface-temperature must be aided by the ear; a myalgia may cause extra heat production. In many other conditions of disease the utility of this method of observation is even more marked. The failing surface-temperature of the limbs during the febrile course of some acute diseases gives warning of impending collapse.

Neurosals affections, so far as traced by the surface thermometer, seem to be attended by a lowering of temperature at the seat of a referred pain or of a reflected irritation, and by an increase of heat on that of the originating centre. Had the interesting record of lowered local temperature given by Dr. Forrest

(*Lancet*, October 12th, 1878,) been aided by the use of a more delicate surface thermometer, the seat of the spinal injury might possibly have been determined. My son has noted increase of surface temperature in a patient of Dr. Bastian's, with right hemiplegia of two months' standing; temperature, right temple, 93° ; left, $91^{\circ}5$; right fore-arm, $93^{\circ}5$; left, $90^{\circ}6$; right leg, $90^{\circ}4$; left, 90° . Except a slight degree of sensation, and the power of extending the leg and great toe a little, the paralysis is complete; it affects the right side of the face, impairing the vaso-motor power on that side, thus causing an increase of surface temperature there, instead of over the probable site of the cerebral disease.

I estimate the normal temperature of the head, taken at the temples, at from 94° to 96° ; of the neck, 96° ; that of the chest, abdomen, and back, $94^{\circ}5$ to $96^{\circ}5$; that of the extremities, 90° to 94° ; the fore-arm and leg sometimes being from one to two degrees lower than the arm and thigh; but, the leg may reach 94° and the fore-arm 95° while covered in bed; the foot may be only 90° while the hand is 96° ; perhaps 95° may be considered a normal surface-temperature. The general temperature in health is $98^{\circ}6$, taken under the tongue; it was so taken in all the preceding cases.

Numerous illustrations of the reliance this mode of thermometry deserves in guiding to the nature and seat of increased action have been accumulated. That it is of value in explaining many of the physiological results of the bath, and in regulating certain matters of hygiene has long ceased to be doubtful. Rub or douche the surface of the body and the temperature of the interior rises, soon afterwards the contracted vessels of the skin dilate, the surface gets warmer and the interior heat is lowered, so that in health the general temperature is equalized. Surface thermometry was devised as long ago as 1839 by Dr. John Davy. All the foregoing observations were made in rooms at a mean temperature of 65° . Care has been taken that the surfaces compared have been equally covered; the axillary temperatures have been guarded from the usual sources of error.

SYMPATHETIC PAIN.

BY DAVID HART, M.B. (EDIN.)

IN considering the physiology of sympathetic pain it will be convenient to take up some of the most typical forms. The ones most generally known are supra-orbital neuralgia and dyspepsia associated with carious teeth, infra-mammary pain in ovarian disease, and orchitis in gonorrhœa.¹ Before proceeding, however, to consider these, it will be advisable briefly to allude to the explanation that such sympathetic pains are due to "reflex action." This has been so stated in an able article on ovarian congestion by Dr. Milner Fothergill: "My hypothesis is this: the currents ascending from the ovary,—of which some reach the brain as sentient pain, possibly along the spinal cord, possibly along the sympathetic,—are met by the descending currents passing into the greater splanchnics and driven off thereby on to the neighbouring intercostal nerves—the sixth or seventh. The perturbations set up in the ovary are thus felt in the terminal fibres of these intercostal nerves as gusts of neuralgic pain."²

Now to such explanation some exception can be taken. Apart from the fact that the same nerve-fibrils can hardly be both afferent and efferent, the serious objection can still be urged that pain cannot be "reflex," and that the use of the term "pain as a reflex action" is loose.

For a reflex action, afferent and efferent fibres are necessary. The former are of a necessity sensory; the latter may be motor, vaso-motor, vaso-inhibitory, cardio-inhibitory, or secretory.

¹ This group may seem to include instances not really "sympathetic." That all are due to the same cause we hope to show further on.

² *American Journal of Obstetrics*, January, 1878, p. 13.

They are never "sensory," for the simple reason that a sensory nerve is always afferent, and there can be no reflexion without descending fibres.

Further, a reflex pain "felt in the terminal fibres of intercostal nerves," and, so far as the statement goes, apart from any sensory centre, is hard to understand.¹ It is still more difficult to grasp how descending currents can drive ascending ones *down* sensory fibres.

Since the reflex theory seems only to lead into difficulties, or indeed is really untenable, we are bound to seek for some other explanation.

For this purpose we shall now consider the common case of "supra-orbital neuralgia" associated with carious teeth.

The usual history of such a case is that the patient has suffered for some time from toothache in one and then in several teeth. This has passed off, to be succeeded by pain over the forehead and temples. The only other feature of interest is that frequent ten-grain doses of quinine have been taken with no other effect than that of adding buzzing in the ears and deafness to the unrelieved neuralgia.

The large root of the fifth is sensory, vaso-inhibitory, and trophic. Thus on section we have, *inter alia*, loss of sensation in the parts supplied and ultimate atrophy also. This latter is said to be prevented by previous section of the cervical sympathetic (Sinitzin). The fifth therefore seems to exert a constant vaso-inhibitory influence over that area of the great vaso-motor centre from which the vaso-motor filaments to the face proceed. Physiologists now admit the truth of Mr. Lister's experiments² as to the existence of vaso-motor centres other than the great one in the "medulla oblongata." It is also known that activity of nerve-cells is due to, or at least associated with, their increased blood-supply, and we may therefore fairly conclude that when the fifth is active its centre is hyperæmic, in whole or in part, according as its terminal fibres are more or less affected. This hyperæmia may be regulated by some local vaso-motor centre on which the sensory fibres of the fifth exert a vaso-inhibitory

¹ A pseudo-reflex pain is obtained when we have inhibition of a vaso-motor centre and pain from pressure of dilated vessels. This will be considered under "Orchitis."

² *Phil. Trans.* 1858.

influence. Thus when the fifth is stimulated¹ we get increased blood-supply and activity in the nerve-cells of the centre, which being transmitted to a higher part of the brain cause pain. If we now apply this explanation to the patient whose case we have already described it is as follows:—

From the unprotected sensory filaments of the fifth in the special carious tooth an irritation (or vaso-inhibition) is conveyed to the centre of the fifth, causing hyperæmia in the area of that centre mapped out for the special fibrils. Pain is felt then by transmission to a higher part of the brain.² The irritation of the tooth being continued, the hyperæmia relieves itself into the adjacent areas of other fibrils. In this way we get pain in the adjacent teeth, with perhaps relief of the pain in the original tooth because its area has been bled with the others, and its normal blood-supply recovered. The areas for the supra-orbital and auriculo-temporal nerves become next congested. These supply parts exposed to pressure and draughts, which are felt as pain when the centre for the parts has its blood-supply and activity roused.

Sometimes, but rarely, further changes occur. In one instance an attack of erysipelas strictly confined to the parts supplied by the sensory branches of the fifth followed neglected toothache and supra-orbital neuralgia.³ Occasionally persistent sickness and vomiting followed, due to the congestion of the fifth relieving itself into the vagus centre adjacent.

This last result leads to the conclusion that “a congested nerve-centre” may deplete into an adjacent one—a true metastasis.

If we now apply this explanation to infra-mammary pain we get the following: The ovary and mamma are closely linked in their functional changes. Thus during menstruation we have the mammae turgid and painful. Probably their centres are adjacent, and thus the infra-mammary pain can be explained as

¹ The nerve-fibres may directly stimulate the nerve-cells themselves. Why it seems better to call in an intermediate vascular change will be explained afterwards.

² For convenience this transmission to a higher part will be omitted in further description.

³ Perhaps the trophic power of the fifth had been lowered, and therefore the erysipelas.

we have already done in the case of supra-orbital neuralgia.¹ The congested centre of the inflamed ovary relieves itself into that for the infra-mammary region, and thus the pain.

We may in like manner explain the curious metastasis in gonorrhœa leading to orchitis. During the course of an ordinary gonorrhœa inflammation begins in the testicle, while the gonorrhœa abates so that even the discharge may cease.²

Two theories have been hitherto advanced to account for this. The first is that the virus in the shape of some infecting leucocytes has passed down the ejaculatory duct, and *vas deferens*. Those who hold this view make it analogous to the cause of a bubo when the virus passes up the lymphatics. This view, however, does not explain the lessening or cessation of the discharge, and is in other respects untenable.³ A more plausible and satisfactory view is, that we have an inhibition of the activity of the vaso-motor centre for the testicle, consequent dilatation of blood-vessels and distress from pressure, &c. This may be one factor in the orchitis, but, like the former, it fails to explain the lessening of the discharge. This is more satisfactorily cleared up on the following supposition:—

The gonorrhœal virus sets up first a local inflammation, which soon extends and obtains a nervous mechanism. The congestion produced in the nervous centre for the urethra ultimately bleeds into that for the testicle, causing trophic and vaso-motor changes. The centre for the urethra is thus relieved, and the inflammation diminishes, or becomes one without a nervous mechanism. If the congestion in the centre for the testicle relieves itself back into that for the urethra, the discharge is aggravated, while the testicle becomes quite well again.⁴ In the

¹ The peculiarities of lactation, &c., may be explained thus:—The impregnated ovum causing uterine growth leads to a congestion of the uterine centre. This goes on rapidly, and about the third month or so begins to relieve itself into the mammary centre, and therefore the mammary changes ensue. After birth, the stimulus which kept up the congestion of the uterine centre is gone, and accordingly it more markedly relieves itself into the mammary one, increasing the mammary function greatly.

² A similar explanation may clear up the absence of menstruation during pregnancy and lactation.

³ Vide Berkeley Hill *On Syphilis*, p. 430.

⁴ That is, as far as continuance of inflammation is concerned.

same way we may explain the beneficial effects of passing a bougie roughly in cases of chronic orchitis.

The question now arises as to the *cui bono* of this sympathetic pain. Why should a woman with *pelvic* distress be misled by an *infra-mammary* pain? Why should any one with gonorrhœa have the additional misery of orchitis added?

Prolonged congestion in any organ leads to serious results. This is well seen in cyanotic atrophy of the liver due to congestion from right-sided cardiac regurgitation. Prolonged congestion of a nerve-centre will have similar serious results. This danger seems to be avoided by a neighbouring nerve-centre becoming congested, and in the case of the *infra-mammary* pain the nerve centre is one functionally less valuable than the ovarian.

But further, the sensory activity of the skin centre is, through constant external education, much higher than that of any other part. A woman does not know, under ordinary stimuli, where her ovary and uterus are, while she is thoroughly cognisant of the locality beneath her left mamma. The same holds good for the knee-pain in hip-disease. The hip-joint gets a branch from the obturator which also aids in the cutaneous supply of the skin over the knee-joint. A patient knows where the skin of the knee is, but not where his hip-joint is. The irritation congests the area in the obturator centre for the hip-joint. The congestion extends into that for the knee-skin, and accordingly pain is felt there, as already explained.

The objection may be fairly urged that too much importance has been attached to a hypothetical hyperæmia of nerve-centres for which there is as yet no proper proof. Whatever be the real explanation of sympathetic pain, it will most probably be found that it is due to an extension of irritation from one centre to an adjacent one. In the present state of our knowledge on this subject, the theory advanced may help to make the "metastasis of pain" somewhat more intelligible to the student.

SOME REMARKS ON THE VALUE OF THE COLD BATH IN ENTERIC FEVER.

BY ALEXANDER COLLIE, M.D. (ABERD.)

Homerton Fever Hospital.

IN September, 1872, I contributed an article on this subject to the *Lancet* in which I remarked that it was of great importance not only to determine that cold baths reduce the temperature in certain acute diseases, but whether such reduction is followed by other good results. That this is not always the case the following example will show. F. G., aged 17, male; admitted into the Homerton Fever Hospital on the 29th September, 1877, having been ill about fifteen days. Pulse 130; temperature 140° F.; tongue transversely fissured, white fur at sides, red and moist at tip and edges; abdomen distended, but no eruption; bowels quiet; lungs clear; no delirium; takes nourishment well.

September 30.—Had a restless night. Was ordered two pints of milk, half-pint of beef-tea, six ounces of bread, egg, wine six ounces.

October 1.—No sleep; restless.

2 p.m.: Was ordered a bath of 70° F. of twelve minutes' duration.

8 p.m.: Quieter since bath, which was not followed by any reduction of temperature. Temperature 104° . Bath at 59° F. of ten minutes' duration.

Midnight: Slept well after last bath, after which the temperature fell to $101^{\circ}\cdot4$, but is now $105^{\circ}\cdot2$. Bath at 59° F. of fifteen minutes' duration.

October 2; Noon.—Slept well all night. Temperature after last bath fell to $100^{\circ}\cdot7$, but is now $104^{\circ}\cdot7$. Pulse 120; lungs clear; bowels open. Bath of 65° F. of eleven minutes' duration.

2 p.m.: Slept well after bath. Temperature fell to $100^{\circ}8$ fifteen minutes after the bath, and to $100^{\circ}5$ thirty minutes after, at which point it has remained till now.

5 p.m.: Temperature 104° . Pulse 120. Bath at 58° F. of eleven minutes' duration.

6 p.m.: Temperature $103^{\circ}6$; fell after last bath to $100^{\circ}4$. Sleeping. Last bath followed by great exhaustion.

October 3.—Passed a good night. Pulse 120, feeble; temperature $100^{\circ}4$ (rect.); fine crepitation over upper two thirds of right chest; no cough; no pain; no increase of respiration. Bowels loose. Wine increased to twelve ounces.

October 4.—Temperature $102^{\circ}2$. Pulse feeble. Respiration 30. Tongue dry and brown; mind clear.

October 5.—Marked dulness of right chest, with tubular breathing; restless night; no cough; no expectoration; otherwise the same.

October 6.—Continues same; takes nourishment well. Temperature $102^{\circ}7$. Pulse 130. Respiration 34. Milk increased to three pints.

October 7.—Moribund.

October 9.—1.30 p.m.: Died.

Post-mortem showed sloughing ulceration of the solitary and agminated glands and pneumonic consolidation of the right lung.

The inflammation and ulceration of the intestine in this case was so severe that it alone would probably have caused death; but it may be fairly asked, was the bath the cause of the pneumonia? The question is a difficult one, because pneumonia is not infrequent when no treatment is employed. It is quite otherwise however with *Peritonitis* in *Typhus*, which Dr. Murchison¹ tells us is almost unknown. He notices but three cases, one recorded by Jenner, one observed at the London Fever Hospital, and one recorded by myself. This last case was the case of a young man aged 17, of excellent physique, who had a sharp attack of typhus, for which he was bathed on account of sleeplessness, delirium, and high temperature. Here, then, we have an internal inflammation occurring in connection with the cold bath in a disease in which such inflammation is practically

¹ *Contd. Fevers*, 2nd Edition, p. 211.

unknown. Whatever view may be taken of the relation of internal inflammation to cold baths, I think enough has been said to suggest caution in their employment.

By German writers it appears to be assumed that given a case of Enteric, a cold bath should follow as a matter of course. Now, whilst we admit the cold bath to be a valuable remedy in this fever, our experience has taught us that it is far from omnipotent; that it is not suited to all cases, nor to all ages, nor to all stages of the disease. It is true that in nearly every case of Enteric the temperature may be reduced by ten or fifteen minutes' immersion in a cold bath of from 70° , gradually reduced to 60° , but it is not true, as we have just seen, that this reduction is always followed by good results. In not a few cases I have seen alarming depression follow such a bath, even when the temperature in the rectum after the bath still registered 101° . In giving the bath then, it will be necessary to watch carefully for symptoms of collapse, and to keep the finger constantly on the pulse at the wrist, and in most cases to administer some stimulant in the bath. In judging of the advisability of its continuance in any particular case we ought to observe not only the effect on the temperature, but also the effect on the general symptoms, the restlessness, the sleeplessness, and the delirium. If there be no improvement in any of these the probability is that the bath is doing harm; for its administration causes some exhaustion, and if this be not compensated for by subsequent rest and sleep, the patient must have lost ground in proportion to the exhaustion which he has suffered. Whether or not the result of the bath has been good or bad may be easily seen. In the former case the temperature is reduced, the pulse somewhat; the tongue becomes moist and clean, the mind clear, and refreshing sleep follows. In the latter the restlessness continues, or intermits but for a short time, the patient looks exhausted, and sleep does not follow. If this occur after one or two baths they should be discontinued, and if antipyretic treatment be considered necessary, quinine should be employed. In deciding as to the kind of cases in which the bath will be beneficial we must keep in mind one of its most constant consequences, its effect on the heart and circulation. The latter is impeded, internal organs become congested, and the action of the heart

itself becomes very feeble, sometimes alarmingly so. From this it would appear to be contra-indicated in cases complicated by internal inflammations; in persons with weak hearts, *e.g.* children and elderly persons, and in those generally who suffer from any form of heart disease. It would appear too to be contra-indicated in cases where the circulation has been weakened by hæmorrhage; and in the latter half of the disease when the heart itself has been weakened from overwork, and possibly some kind of specific degeneration. It should not be given when convulsions are present, during menstruation, nor where it continues to alarm the patient. In very young children and in very old people, it should not be employed at all.

Generally it will be found useful in the *earlier* stages of the disease; in young persons with uncomplicated attacks, whose hearts are sound and not acting too feebly, who suffer from continued sleeplessness and delirium, which we prefer as a guide to a fixed line of temperature. We have never given more than three baths in the twenty-four hours; and we should not give in any case more than four, and then only on clear evidence that they were doing good. The duration of the bath should not, as a rule, exceed ten minutes, and in boys and girls of ten, not more than seven minutes. Towards the end of the second week I should, in the majority of cases, discontinue the bath and, if an antipyretic were needed, give quinine, which should be given to children and elderly persons instead of the cold bath.

HEALTH RESORTS IN AUSTRALASIA, SOUTH AFRICA, AND SOUTH AMERICA, OR MEDICAL CLIMATO- LOGY OF THE SOUTHERN HEMISPHERE.

BY C. FABER, M.D. OF STUTTART.

(Continued from No. CXIX.)

II.—SEA-COAST PLACES OF SUB-TROPICAL AUSTRALIA.

ROUNDING Cape Howe we come from New South Wales to *Victoria*. The meteorological data from which we may judge of the climate in different parts of this colony are much fewer than in New South Wales, *Victoria* having fewer meteorological stations, and those rather unevenly distributed over its area.

The first person to make observations on the climate of *Victoria* on an extensive and scientific scale was, as far I know, my highly-esteemed friend, Dr. G. Neumayer, then Director of the Flagstaff Observatory, Melbourne, now Director of the Deutsche Seewarte, Hamburg. To him meteorology, and in particular that of *Victoria*, owes indeed very much. His publications thereon, comprising the period from 1858—1863, are standards of their kind. The present Government Astronomer of *Victoria* is Mr. Robert Ellery, F.R.S., a gentleman equally distinguished for his high professional and personal qualities. Besides the regular monthly Reports, he has published short Summaries on its climate in 1867 and 1873.

The *Victorian* coast stations are situated within long. E. 150° —Gabo Island; and $141^{\circ} 37'$ —Portland. The first-named station is at the same time the one nearest the equator—lat. S. $37^{\circ} 30'$ —whilst Cape Otway, in lat. S. $38^{\circ} 52'$, is the southernmost one.

Going, therefore, from east to west, *Gabo Island*¹ comes first, with a mean annual temperature of $58^{\circ}7$. At Eden, the nearest coast station in New South Wales, and only half a degree more to the north, it is, as we have seen, as high as $60^{\circ}3$; this station being sheltered from the cold southerly winds by the projecting south-eastern corner of the Australian continent, of which Cape Howe is the extreme point, and moreover deriving additional heat from that warm sea-current that runs down along the east coast.

Port Albert, to the north-east of Wilson's Promontory, has a mean annual temperature of $56^{\circ}4$; mean of coldest month—July— 47° ; of hottest month—January— $65^{\circ}3$. The latter month is by one degree hotter; the former by two degrees colder, at Port Albert than at Gabo Island.

Melbourne, the capital of Victoria, and at the same time the largest city under British rule on the southern hemisphere, situated in lat. S. $37^{\circ} 50'$, has a mean temperature of $57^{\circ}6$. This approximately represents that of the colony generally, namely $56^{\circ}8$. *Cape Otway*, rising 270 feet above the sea, and projecting into the southern ocean, has the lowest temperature of the Victorian sea-coast stations, viz. $55^{\circ}2$; the next and last coast station, *Portland*, has the highest— 61° . At the latter place the temperature of the hottest month is 67° , scarcely higher than at Melbourne, and not quite 5° higher than at Greenwich, whilst that of the coldest month is at Portland about 6° higher than at Melbourne, and 15° higher than at Greenwich, namely $53^{\circ}6$. This temperature exceeds that of May at Greenwich.

That the climate of Portland is so remarkably warm depends, I should think, on several circumstances combined: in the first place on its sheltered position inside Portland Bay; then, as Mr. Ellery points out, on the neighbourhood of warm ocean-currents; and last, not least, on its being open towards that vast stove—as we may call it—the central desert of the Australian continent, there being no dividing range to speak of

¹ In order to be able to follow this medico-climatological treatise, it is advisable to have a good map of Australia at hand. The best one I know of, and which has done good service to myself, is by A. Petermann, Nos. 50b and c of Stieler's Atlas, which may be got through any bookseller.

between them, as in the case of the other sea-coast places of Victoria and New South Wales.

The difference in temperature between the hottest and coldest months ranges at the Victorian sea-coast stations from 11° —Cape Otway; to 19° —Melbourne.

The climato-therapeutical conclusions to be drawn from the data given these as of the other places already mentioned, or yet to be mentioned, will only be come to in the third part of this medical climatology of the Australian continent, after we shall have considered not only the other meteorological elements beside temperature, but also the physiological and pathological conditions which the Australian climate produces. This second part will be of more special interest to my medical readers, and I must beg them to have patience with this part, and not to be frightened away by figures, which, dry as they are, form the basis, and must give the value to any climatological treatise. So let us go straight at them, and right into the details of the *Melbourne climate*, the temperature of which, as has been remarked, approximately represents that of the colony generally.

The mean temperatures of the four seasons are: summer $65^{\circ}3$; autumn, $58^{\circ}7$; winter, $49^{\circ}2$; spring, 57° . At Greenwich the corresponding figures are: 61° , 50° , 39° , 47° . Autumn is at Melbourne about 9° , winter and spring are about 10° warmer than at Greenwich; the difference is smallest in summer, when it is only a little over 4° .

During seventeen years (1858—1874) the thermometer in the shade has risen at Melbourne, 61 times, to or above 100° ; and only in two years has it failed to rise so high. During the same period it has fallen 52 times to or below the freezing-point. In three years only it did not fall so low.

The greatest yearly range of temperature was $82^{\circ}6$, in 1868; *i.e.* still 10° less than the extreme range observed at Greenwich within a thirty-five years' period. Yet Melbourne has, as we have seen, the least equable climate of all the Victorian coast stations. This is shown by a comparison between the maximum temperatures ever observed; that of Melbourne being $111^{\circ}2$, while that of the other stations, where I find the maximum and minimum temperatures to be recorded, *viz.* Cape Otway and Portland, it was 105° and 108° respectively. The absolute minimum

was the same— 27° at Melbourne and Portland ; at Cape Otway it was 30° . The average yearly range at the two first-named places is 76° and $69^{\circ}5$ respectively.

The greatest monthly range of temperature at Melbourne during that fourteen years' period was 69° , in December, 1868 ; the smallest was 23° , in August, 1861. At Greenwich the extreme range of mean temperature is greatest— 60° in September ; smallest— 47° in November.

The mean daily range is, in round figures, at—

	Melbourne.	Greenwich.
In Summer	22°	21°
Autumn	$18\frac{1}{2}^{\circ}$	15°
Winter	15°	10°
Spring	20°	18°

The greatest mean daily range was 27° , in November, 1862 ; the smallest was $7^{\circ}7$, in June, 1860.

The highest solar radiation observed at Melbourne in fourteen years was 160° ; the lowest terrestrial radiation 22° .

The mean annual temperature of the soil at a depth of six feet in Melbourne is 61° ; in Greenwich $51^{\circ}7$, a difference which exceeds that of their respective air temperatures by one degree. The difference between the latter— $57^{\circ}6$ —and the mean temperature of the surface soil— $62^{\circ}4$ —is nearly as much again at Melbourne as at Greenwich, showing the greater intensity of insolation at the former place.

Of *coast district stations* there are, I am sorry to say, only two in Victoria : *Camperdown*, about half way between Melbourne and Portland, with a mean temperature of $54^{\circ}6$, and *Berwick*, near Melbourne, with 57° . It is a matter of special regret that there is not one regular station in those eastern coast districts known under the collective name of Gippsland, which *is said* to offer the advantages of a bracing subalpine climate, together with those of the Australian climate in general.

On the meteorology of *South Australia* there are no regular yearly reports issued, as Sir Arthur Blyth, the Agent-General for that colony, informed me. Its Government Astronomer, Mr. Ch. Todd, holding at the same time the post of Postmaster-

General and Superintendent of Telegraphs of that large territory, comprising 750,000 square miles, cannot be expected to have much time left for compiling such. He has, however, in the *Handbook of South Australia*, given a most valuable contribution to its climate (Adelaide, 1876.)

There appears to be as yet very few regular meteorological stations, *i.e.* such as are furnished with a regular set of instruments, besides a rain-gauge, established in that colony. In Mr. Todd's report I count six all told, five in the south; one—Port Darwin—in the north. Of the former, two are sea-coast stations, *viz.* *Robetown* in lat. S. $37^{\circ} 10'$, with a mean temperature (in 1874) of 58° , *i.e.* over 2° less than Eden, in about the same latitude on the east coast; and *Adelaide*, if this latter place can be called a coast station, lying, as it does, some miles off the sea.

Adelaide, the capital of South Australia, in lat. S. $34^{\circ} 53'$, long. E. $138^{\circ} 39'$, has, for the ten years 1865—1874, a mean temperature of 63° , which is half a degree higher than that of Sydney, though the latter place is one degree nearer the equator. The temperature of the summer quarter— 73° —is over two degrees; that of autumn— $64^{\circ} 3'$ —only half a degree higher; but that of winter— $53^{\circ} 2'$ —only a trifle; that of spring— 62° —one-half degree lower at Adelaide than at Sydney.

The mean daily range at Adelaide is $20^{\circ} 6'$, which is less than might be expected in a place where those two opposite climates, that of the southern ocean on the one side, and that of the central desert, are, as has been pointed out somewhere else, in such immediate contact. At Greenwich, with its insular climate, it is only four degrees less. This is mainly accounted for by the temperature in Australia keeping on a high level throughout.

In summer the mean daily range at Adelaide is 25° ; in autumn, 20° ; in winter, 15° ; in spring, 22° . The greatest range— $25^{\circ} 4'$ —coincides with the hottest month, January; it is lowest— 14° —in June. These extremes— $21^{\circ} 2'$ and $9^{\circ} 4'$ respectively—take place in exactly the corresponding months, July and December, at Greenwich.

Mr. James illustrates the daily changes of temperature at Adelaide (in summer) by saying: "At present, for example,

the thermometer in the morning may be about 66° ; 96° or 98° at midday, and 66° or even lower again by night." At Cairo, a place which is also greatly influenced by the adjacent vast deserts, one on either side, the mean difference between the temperature at 7 A.M. and that at 2 P.M. in July was 17° , viz. 71° and 89° respectively. In winter, the temperature during the day at Adelaide ranges between 55° and 70° .

During the hottest months, December, January, and February, the temperature frequently exceeds 100° , but it scarcely does so in November and March, when the nights are also cooler. After March, in the Australian autumn, the temperature falls rapidly, so that the mean of April— $64^{\circ}6$ —is $5^{\circ}5$ below that of the preceding month; and for May it is only $58^{\circ}2$. The weather during these months is "simply perfection."

On an average the temperature on forty-three days in a year exceeds 90° . The highest temperature ever observed, and that on two occasions, was $113^{\circ}5$; the lowest, 34° . The highest temperature in the sun was 164° ; the lowest reading of a thermometer, with its bulb on wool, placed on the ground, was $24^{\circ}6$.

It is a well-known fact that in the northern hemisphere at least there is a remarkable difference between the temperatures of the western and eastern coasts of its continents, that of the eastern coasts being, mainly on account of their severe winter, considerably lower than at the western coasts. This difference is the more marked the higher the latitude, and diminishing as we approach the equator it is already inconsiderable in lat. N. 40° .

On the southern hemisphere the same difference has been noticed with regard to the continents of Africa and South America, but instead of following the same rule as the northern hemisphere, it is considerable under the equator, and becomes less as the two continents taper off. With regard to the continent of Australia no such comparison, as far as I know, has yet been made, but I shall now proceed to do it.

On the west coast of Australia, *Perth* and *Freemantle*, situate in nearly the same latitude—about 32° —the latter, on the mouth of the Swan River, the former, the capital of Western Australia some ten miles higher up the same river—are the only places where regular meteorological observations are known from.

A short table showing the mean temperatures—for three years—of these places on the one side, and of Sydney on the other, which latter place, however, being nearly two degrees more distant from the equator, will give some information on the point in question :—

Mean temp. at Freemantle.	Perth.	Sydney.
Of year . . 63 . .	64·5 . .	62·5
Summer . 70 . .	72·5 . .	70·4
Autumn . 63·7 . .	66·3 . .	63·8
Winter . 56·3 . .	57 . .	53·4
Spring . 61·7 . .	62·8 . .	62·5

From this table we see that scarcely any difference to speak of in the mean annual temperature is left when we take into consideration the difference in latitude of those western places and Sydney. In accordance with this, the mean temperature of two eastern coast places—Newcastle and Port Macquarie—combined, which correspond as nearly as possible in latitude with the former, is exactly the same as that of Perth and Freemantle combined. Yet the general climatic character of eastern coasts may be traced in this case also, if we look at the distribution of temperature over the different seasons. At Sydney the winter is distinctly cooler, and, taking into consideration higher latitude, the summer comparatively hotter, than at Freemantle.

Whilst the difference in temperature between summer and winter is thus smaller at those western places, the yearly and daily ranges, especially the latter, appear to be considerably greater here than at Sydney. This, I think, may be accounted for by their being less sheltered from the influence of the vast inland desert.

The annual extremes were, at Freemantle, $101^{\circ}8$ and 28° ; at Perth, 107° and 38° respectively. The mean daily fluctuation of temperature at Perth is, in summer, $23^{\circ}4$; in winter, $17^{\circ}5$; *i.e.* taking the mean of both, about the same as at Adelaide.

III.—TEMPERATURE OF THE MOUNTAIN AND TABLELAND STATIONS OF AUSTRALIA.

To the best of my knowledge, these all lie in subtropical, there are none yet established in tropical, Australia. They are of considerable practical interest in a climato-therapeutical

respect, as they are the nearest refuge in the hot Australian summer, and will no doubt be made use of more extensively, and appreciated more fully, as those regions advance in the way of communications and of accommodation. It is, therefore, not out of place in a medical climatology of Australia to give the climate of the principal mountain-places at least in some detail.

Mountain places I call such as are at least 1,500 feet above sea-level.

The *mountain system of New South Wales* consists of parallel ranges, with here and there transverse ranges intersecting or branching off, and with tablelands extending between them. It occupies the width of about two degrees of longitude. The highest of those ranges which run parallel with the east coast, and of which the well-known Blue Mountains form a part, may be called the Dividing Range *proper*, forming the watershed between the Pacific and the enormous system of the river Murray.

There appears to exist a marked thermic difference between places of the same latitude and altitude, but situated the one on the east or seaward, the other on the west or inland, side of that Dividing Range *proper*, such as Murrurundi and Goonoo-Goonoo respectively. On the latter side the mean annual temperature is higher, summer being hotter, winter cooler, but not so much so as to compensate for the plus in the warm season. Also the daily range is considerably greater on the western side.

The highest mountain station—4,640'—is *Kiandra*, situate on the Australian Alps, in lat. S. 36°. This is the only meteorological station in Australia, which has a mean temperature lower—45°—than that of Greenwich—49°4. Summer there is considerably, but winter scarcely, cooler than at the latter place. Though at Kiandra frost, snow, and hail reign for a considerable portion of the year; still one day it may be found most eligible for a summer resort, surrounded as it is by grand alpine scenery.

Next to Kiandra, in temperature and latitude, stands *Cooma*. It is the most southern mountain station in New South Wales, some 2,000 feet lower than Kiandra. Its temperature is 52°; its

mean daily range is $26^{\circ}6'$, the largest at all the stations east of the Dividing Range *proper*. Of these the principal ones are : in the north *Armidale*, 3,278 feet ; lat. S. $30^{\circ} 34'$; *Goulburn*, 2,129 feet ; lat. S. $34^{\circ} 45'$, in the south. Their climate is not much different, the higher latitude of the one being to some extent compensated by the higher altitude of the other. Mean temperature at *Armidale*, 60° ; at *Goulburn*, $55^{\circ}6'$. Mean maximum of hottest month, 83° and 85° respectively, which is about five degrees higher than at Sydney, and about ten degrees higher than at Greenwich. Mean minimum of coldest month, 33° and 32° respectively, *i.e.* about the same as at Greenwich, but about twelve degrees lower than at Sydney. Mean daily range about 25° . At *Armidale* it is greatest in December, smallest in June ; at *Goulburn*, in April and July respectively. The extremes were, at *Goulburn*, in 1874, $104^{\circ}4'$ and $20^{\circ}8'$.

In a central position on the Blue Mountains and on the Sydney-Bathurst Railway, seventy-seven miles from the former city, lies *Mount Victoria*, 3,490 feet above the sea—a place which seems, from its beautiful scenery and its bracing climate, to be destined by Nature for a summer resort. As such it appears already largely to be appreciated, at least, when I was there : its two hotels, as well as the private lodgings, which, however, are few as yet, were overcrowded with visitors. Mean temperature, 54° ; mean maximum of hottest month, $82^{\circ}6'$; mean minimum of the coldest month, 32° . The main daily range is comparatively small— 20° . There are, however, great and sudden changes of the weather, and in particular of the temperature, as in most mountain-places. I shall never forget one beautiful night, of perfectly tropical splendour and mildness, the air all filled with the most fragrant odours from the surrounding blossom-covered forest ; a night so delicious and grand in its moonlit scenery that we could not sufficiently enjoy it in the open air. On the previous night log-fires had been burning in the rooms to keep the cold out !

Bathurst, one of the oldest settlements in Australia, some 140 miles from Sydney, with which it is connected by an interesting railroad, is situate beyond the Dividing Range, 2,200 feet above the sea-level, on a fine open country, which unfortunately is devoid of trees, a great disadvantage to an aspiring summer

resort. Besides, its climate is subject to greater fluctuation than any of the other mountain or tableland stations. The daily range is over thirty degrees. The difference between the mean maximum of the hottest month— 89° —and the minimum of the coldest month— $29^{\circ}6'$ —is about 60° against 50° at Mount Victoria, and 34° at Sydney. At Greenwich it amounts to $40^{\circ}5'$. The absolute extremes were, at Bathurst, in 1874, $103^{\circ}5'$ and 21° respectively. Its mean annual temperature is 57° , *i.e.* three degrees higher than at Mount Victoria.

In the colony of Victoria the Dividing Range has a lower elevation than in New South Wales, except in the east, where the Australian Alps rise up to over 6,000 feet; but where there are no meteorological stations. There being only one range, no tablelands are to be found in Victoria, such as have been noticed in New South Wales. On the seaward or southern side of that range there is first *Ballarat*, once famous for its gold-mines, the yield of which has fallen off considerably compared to what it used to be. Ballarat is 1,438 feet above sea-level, and seventy miles from Melbourne, with which it is connected by rail. Its mean temperature is 54° . The extremes were, during sixteen years, 109° and 22° respectively. From its being a mining place, and from what I have seen of it, I should not exactly recommend it to invalids.

West of it, at the very foot of the Dividing Range which in this neighbourhood reaches a considerable height (Mount William, 3,825 feet), lies *Ararat*, 1,050 feet above sea-level, with a mean of 58° . Summer is remarkably hot here, whilst it is comparatively cool at Ballarat.

Of the stations north of the Dividing Range there are only two which can be called mountain places in the sense hitherto used, of being at least 1,500 feet above sea-level, *viz.*, *Beechworth*, the terminus of a branch line of the Melbourne-Albury Railway, situate to the north-west of the Australian Alps, 1,784 feet above the sea, with a mean of 57° , hot summers and cool winters (January $70^{\circ}4'$; July $40^{\circ}8'$); and *Daylesford*, north-east of Ballarat. This is the highest station in Victoria, 2,090 feet above sea-level, and consequently has the lowest mean, 53° . Summer there is much cooler than at Beechworth, whilst winter is warmer, if we go by the figures

given in Mr. Ellery's "Notes on the Climate of Victoria," where, however, the number of years of observation is not given, a point of considerable importance, considering the great irregularity of the Australian climate.

In the hilly country that stretches to the north of the Dividing Range until it loses itself in the great Murray plains, lie, from west to east, *Stawell*, with a mean of $57^{\circ}7$; *Castlemaine*, a pretty, English-looking place, with a comparatively temperate climate, mean, 56° ; January, 68° ; July, 43° ; *Sandhurst*, 758 feet above sea-level, on the Melbourne-Echuca Railway, as is also the last-named place. Sandhurst is at present the greatest place for gold-mining in Victoria, having soon outrivalled Ballarat. But also here the yield has considerably fallen off. When I was there, only one out of the many costly quartz-reef workings was really doing tall work. All round smokeless chimneys stared gloomily into the sky. Altogether the place does not present an inviting aspect to one who is in search of pleasure, rest, or health. It is, moreover, a hot place, as I can testify from my own experience. Whilst its mean temperature, $58^{\circ}6$, is not much higher than that of Melbourne, summer is much hotter at Sandhurst (January, $70^{\circ}7$, against $66^{\circ}6$ at Melbourne); on the other hand, winter is cooler (July, $45^{\circ}6$, against $47^{\circ}8$ at Melbourne). The extremes were during fourteen years, $117^{\circ}4$ and $27^{\circ}5$ respectively.

Heathcote, some thirty miles west of Sandhurst, has a similar climate, only a little more excessive still. Mean temperature, $57^{\circ}4$.

In *South Australia* there appears to be only one mountain station, *Mount Barker*, in the Mount Lofty Ranges that rise up behind Adelaide. The exact altitude of that station I do not know. Its mean temperature was in 1874, 56° , *i.e.* 7° lower than that of the capital. In summer this difference is still greater. Those Mount Lofty Ranges to be reached "in an hour or two," ought, therefore, to be a great boon to the citizens of hot Adelaide.

(To be continued.)

Reviews.

Medicinal Plants; being Descriptions with Original Figures of the Principal Plants employed in Medicine, and an Account of their Properties and Uses. By ROBERT BENTLEY, F.L.S., Professor of Botany in King's College, and of Botany and Materia Medica to the Pharmaceutical Society, Etc.; and HENRY TRIMEN, M.B., F.L.S., Department of Botany, British Museum. Parts 13—31. London: Churchill.

THE later parts of this excellent work quite fulfil the promise given by the earlier numbers which we noticed some time ago (*Practitioner*, vol. xviii., p. 281.) Not only do they contain figures and descriptions of the ordinary officinal plants which are to be found in other books; they also give those which have only recently been discovered, such as the sumbul plant, which they find to be a ferula and not an euryangium. The *Ferula galbaniflora*, one of the sources of galbanum, is figured for the first time in this work. In the parts now before us, we also find several plants which are of great interest to medical men, such as the *Gynocardia odorata*, the source of chaulmoogra oil, the coca plant, to which such wonderful sustaining powers are ascribed; the *Cimicifuga racemosa*, better known as a remedy for rheumatism under the name of *Actæa racemosa*; the *Veronica virginica*, or leptandra root, which is said to be a powerful cholagogue; the *Santalum album*, or sandal-wood, which yields an oil of great efficacy in gleet, as well as other plants of much interest. The letterpress accompanying the plates gives a good general account of the actions and uses of the plants in medicine, as well of their habitat and botanical characters; and the bibliography shows where further information regarding either the well-known drugs or the new remedies may be obtained by the reader who desires it.

A Handbook of the Theory and Practice of Medicine. By FREDERICK T. ROBERTS, M.D., B.Sc., F.R.C.P. Third Edition. Two volumes. London: H. K. Lewis.

WE should hardly consider it necessary to review the third edition of this *Handbook*, which has now thoroughly established its position as a class-book of Systematic Medicine, were it not

that, at the beginning of the winter session, many of our readers will probably be glad to be reminded that such a valuable work is within the reach of their young medical friends. In our review of the first edition, five years ago, we ventured to foretell the success of Dr. Roberts' book; and the two handsome volumes constituting the third edition, which now take the place of the single volume of the first, is the best evidence how fully our anticipations have been realised. The portions of the work that relate to therapeutics are necessarily general in their character, but they are at the same time so well chosen, rational, and suggestive, that they cannot fail to impress the student with the paramount importance of what is, after all, the end and aim of the mass of pathology and symptomatology with which his mind is burthened—the treatment of disease. On this account, and for every other reason, Dr. Roberts' book may be confidently placed in the hands of all earnest workers at practical medicine.

Lectures on Clinical Medicine. By DR. MCCALL ANDERSON.
8vo. with Illustrations. London: Macmillan and Co.

Clinical Medicine: Lectures and Essays. By BALTHAZAR FOSTER, M.D. London: Churchill.

A Series of American Clinical Lectures. Edited by E. C. SEGUIN, M.D. New York: G. P. Putnam Sons;—London: Sampson Low, Marston and Searle.

HOWEVER well-written a text-book on medicine may be, it cannot possibly treat every disease in sufficient detail, and with the necessary amount of illustration, to give that vivid picture of the malady in its various phases which is so interesting to the physician and so useful in practice. Records of individual cases, on the other hand, are often prolix, wearisome, and not very instructive, as the symptoms presented are not analysed and compared with those of other cases resembling them in their main features but differing in certain particulars. Between the two stand such works on clinical medicine as we have named above, in which a number of interesting cases judiciously selected are briefly recorded, compared with one another, the symptoms analysed, and the rationale of treatment carefully discussed. Such works must needs be of great interest to every practitioner, and the above are no exception to the rule. Although they all treat of clinical medicine, the subject is so wide that they all deal almost entirely with different diseases, and even when the same disease is treated of they view it in different aspects. Dr. Anderson begins with an introductory chapter on the mode of teaching medicine, and on recent progress in diagnosis and treatment, along with a few words of good advice regarding the

usefulness of trained nurses. Amongst other interesting points in this chapter we may notice a case illustrating the beneficial action of ice to the hepatic region in removing congestion of the liver, and the successful employment of the continuous current to the head as a substitute for chloral in cases of sleeplessness.

The next lectures are devoted to the phenomena of embolism, disease of the pons varolii, the treatment of aneurism of the arch of the aorta by galvanic puncture, and aneurism of the abdominal aorta. In the treatment of aneurism by galvanic puncture, the author thinks that the results are better when a single needle connected with the positive pole is introduced into the swelling, and when a weak current only is employed. He narrates two cases in which the operation was successful for the first time in Scotland. In discussing tubercular peritonitis he instances some cases in which it was apparently recovered from, and in the next chapter, on acute phthisis or galloping consumption, he gives some interesting observations on the effect of quinine, digitalis, and opium combined, upon temperature.

We would suggest to Dr. Anderson the possibility that the successful cases which he records were really cases of typhoid fever complicated by lung symptoms. We have lately seen several cases very closely resembling those narrated by Dr. Anderson both in symptoms and course, and there could be little or no doubt that these were really cases of typhoid, as some of the patients who died presented the characteristic intestinal ulcers. But whether or not the cases recorded by Dr. Anderson are really those of galloping consumption, the success of his treatment is well worthy of attention. The remaining lectures are devoted to mediastinal tumours, Bright's Disease, multiple fatty tumours, lupus verrucosus, ephidrosis cruenta, elephantiasis arabum, and vegetable parasites of the skin.

It would take too long to analyse these lectures, but we would commend the entire work to the attention of our readers.

Dr. Foster's work is by no means a recent one, but it has not yet been noticed in the *Practitioner*, and we take this opportunity of mentioning it, as it to some extent supplements that of Dr. Anderson, the subjects treated being chiefly affections of the circulation, such as cyanosis from patent foramen ovale, the use of digitalis in heart disease, the rupture of the aortic valves by accident, the synthesis of acute rheumatism, the use of the sphygmograph and cardiograph in the study of diseases in the heart and vessels, and embolism following thoracentesis. His observations on the use of digitalis are very good; and he shows that the prognosis of aortic regurgitation depends very much on the segment of the valves which is implicated. When the coronary

segment is destroyed, the circulation through the heart itself becomes very imperfect, and rapid degeneration and consequent death ensue. Although we are not certain that acute rheumatism is actually due to lactic acid in the system, yet Dr. Foster found that this disease came on during the administration of the drug in a case of diabetes, and shows with a considerable amount of probability that this was no mere coincidence, but was actually due to the effects, direct or indirect, of the acid itself.

The sphygmograph and cardiograph are, to a great many, simply interesting toys, and this mode of regarding them is to a great extent due to the fact that there is almost no work in the English language which gives an account of their clinical application in such detail as to make it very useful in practice. The observations contained in this work tend to some extent to supply this want. The other subjects treated are Duchennes' paralysis, diabetes mellitus, gastric ulcer, and ether in the treatment of phthisis.

In contrasting the value of partial with complete abstinence from food in gastric ulcer, he shows that the latter is a much more effectual and rapid means of cure; and in the treatment of phthisis his observations go far to demonstrate that the combination of ether with cod-liver oil is most important as a means of increasing the nutrition of the patient and thus combating the disease.

The short sketch we have given of the contents of these works is sufficient to show that both will prove interesting as well as instructive, and renders further comment unnecessary.

Clinic of the Month.

Paracentesis Abdominis and Thoracis by Capillary Tubes.—Dr. James Goodhart indicates the advantages of adopting a small needle-like trocar in cases of effusion into the abdomen and chest, primarily on account of the slightness of the pain; secondly, because of the comparative absence of risk of the subsequent occurrence of peritonitis; and thirdly, because the drainage being effected slowly and completely, there is less risk of shock. He advises that when small drainage tubes are used, they should, after use, be cleansed by boiling in some antiseptic fluid. (*Lancet*, Aug. 24, 1878.)

Carbolic Acid in Smallpox.—Some difference of opinion seems to exist in regard to the value of carbolic acid lotion in smallpox amongst those who have used it, some expressing themselves very warmly in its favour, others thinking its importance and its effects overrated. Thus Dr. R. Lockhart Lawson gives the details of a case in which he tried it with excellent results. The face on the day before he used the lotion was red and perspiring, but after the use of the lotion the countenance was natural in colour, and had lost the febrile aspect. The lotion used in this instance contained one part of carbolic acid in twenty of water. Dr. Lowe and Dr. Kellett recommended the application of a stronger lotion, one in eight, and have obtained good results. On the other hand, Mr. H. Taylor thinks that under any line of treatment, or under no treatment, the great majority of vaccinated cases end in the rash aborting, however severe, or however copious it may appear at the outset, and suggests that, to establish the value of the acid, details should be given of its effects in unvaccinated cases. Mr. Taylor's observations are of value, since he can appeal to the results obtained from the use of the acid in the large hospital at Hampstead. (*Lancet*, Aug. and Sept., 1878.)

The Assimilation of Quinine.—The relation of the amount of quinine eliminated by the urine to that taken by the mouth has been studied by M. Personne, with the object of determining the quantity that is destroyed in the economy.

He concludes that about one half of the amount ingested is destroyed. He found that all the quinine that is eliminated by the urine and soluble in acids can be transformed into neutral sulphate of quinine without appreciable residue; also that a resinous material is obtained insoluble in acids, and similar to that which is obtained during the extraction of the alkaloids of cinchona. Hence it is inferred that the quinine which is eliminated by the urine has not undergone any appreciable alteration or isomeric modification. These substances represent nearly one half of the quinine which is taken in, and hence at least one half must be destroyed in the economy. (*Lancet*, Sept. 7, 1878.)

An Arab Remedy for Hydrophobia.—The wide distribution of rabies is curiously illustrated by the belief among comparatively uncivilised races in specific remedies for hydrophobia; and the recognition of the disease, and of the connection between it and the antecedent bite, is an illustration of the remarkable accuracy of the rude pathological observation of uncultured races. A note on a popular Arab prophylactic was lately communicated to the Société d'Entomologie of France, from M. de Chevarrier of Gabes, in Tunis, accompanying some fragments of *Coleoptera*, recognised by M. de Saulcy as belonging to the *Meloe tucius* (Bossi), and the *Mylabris tenebrosa* (Castelnau)—insects which possess a power of blistering similar to that of the *Cantharis vesicatoria*. Their congeners are common in France. The note stated that the fragments had been obtained south of Ouderna, from a man of the tribe of the Amernas, who possessed a dozen, of which he took the greatest care. He detailed their virtues and the mode of their use. On returning to Gabes M. de Chevarrier spoke of the remedy to a very intelligent Arab, who confirmed the statements, and said that the remedy was described in the Arab treatises on medicine. They state that a piece of the insect the size of a grain of corn, given in a piece of meat, will prevent hydrophobia, if given within twenty days of the bite. The strongly irritant property of the insect renders a stronger dose dangerous to life. Even that quantity occasions frightful colic. The Arabs were unanimous as to the efficacy of the remedy. (*Lancet*, July 27, 1878.)

The Nature, Causes, and Treatment of Summer Diarrhoea.—Dr. William Johnson, of Leicester, states that for some years Leicester has experienced a higher rate of mortality from summer diarrhoea than any other of the large English towns. The patients, of whom he appears to have seen many, suffered from febrile symptoms, with vomiting, disturbed sleep, and considerable depression. Emaciation set in rapidly in infants. The temperature rose in some instances to 103° or 104°. The

evacuations were alkaline in reaction, offensive in odour, some deeply tinged, others pale or grey, separating on standing into two layers, an upper coating and a lower, composed of partially undigested food. Microscopic examination of the upper layer showed particles of undigested food, fat globules and innumerable bacteria of two forms, minute spherules and rods, some resting—others in active motion. Similar bacteria were present in the vomited matters. It is to the presence of these bacteria in the intestine, introduced by food and air, that Dr. Johnson attributes the origin of diarrhoea as it affects infants and adults. The disease depends upon putrefactive changes in the bowel contents, which changes are correlative to the development and multiplication of these microscopical organisms. The bacteria develop in the moist air of ill-ventilated and non-cleansing sewers, and from cesspools, when the temperature rises above 57° F. From the sewers and other places they are raised into the air during hot weather, especially when conjoined with great atmospheric dryness, by the force of evaporation. In badly sewered districts, milk and over-ripe fruit, and in hot weather the air itself when filtered, is found to contain numbers of the rod-shaped and spherule-like bacteria. The treatment which Dr. Johnson finds best adapted for the cure of this summer diarrhoea, consists in the administration of antiseptics, either alone or with mild astringents. And for this purpose, carbolic acid, quinine, salicylic acid, the mineral acids, especially dilute sulphuric or benzoic acid, thymol, and borax, are the most useful. (*Lancet*, Sept. 1878.)

Paracotoin in Cholera.—Prof. Baelz, of Tokio, employed this drug in the outbreak of cholera which occurred last year at Yokohama. The paracotoin was administered to five patients in the form of a 0.2 gm. subcutaneous injection, suspended in equal parts of water and glycerine, the results being most remarkable and favourable. All the patients were Europeans settled in Japan. The only drawback to the employment of paracotoin for hypodermic injection lies in the difficulty with which it is soluble in suitable fluids. Equal parts of glycerine and water appear to be the most convenient medium. In spite of the few trials which paracotoin has had, it still appears to be one of the most valuable agents yet known for the treatment of cholera. Prof. Baelz promises to publish any further results which he may obtain. (*Centralblatt f. Med. Wiss.*, July 6, 1878.)

Salicylic Acid in Yellow Fever.—Dr. Hartwig Bünz, of Savannah, finding that the ordinary method of treatment of yellow fever, by emetics and purgatives, was of no avail during an epidemic at Georgia in 1876, had recourse to salicylic acid,

as the fever was of an intermittent type. Good results were obtained by administering the salicylic acid in doses of one drachm and a half for adults, given in solution, in capsules, or with sugar. In cases in which the stomach rejected the acid, three drachms were given by the rectum. Patients treated in this way suffered much less from pain in the spine and limbs than those treated with quinine; the temperature, which was ordinarily 104° to 106° F., fell to 100° to 99° F., and the pulse from 120 per minute almost to the normal. Dr. Bünz believes that salicylic acid is the most powerful antipyretic against yellow fever of the intermittent and remittent type: he has not tested its value in cases of the continuous form, interesting as this would be, for over them quinine exercises no perceptible influence. (*Berliner klin. Wochensch.*, Sept. 2, 1878.)

Large Doses of Belladonna in Intestinal Obstruction.—Dr. Norman Kerr puts on record five cases of intestinal obstruction which he has successfully treated by the administration of belladonna in two-grain doses every hour. The total amount of belladonna given ranged from five grains the lowest, through nine and fourteen grains, to sixteen grains the highest. The accessory treatment consisted in fomentations, warm enemata, gruel, and beef-tea per rectum; ice, iced-milk and soda-water by the mouth. Attacks of obstruction occurring afterwards were also treated successfully by the administration of belladonna. In no case was alcohol prescribed, but in one it was taken as two ounces of port wine before the belladonna treatment was begun. In the after treatment pulvis glycyrrhizæ composita has been found the most effectual remedy, as a preventative of obstruction. (*British Medical Record*, Aug. 31, 1878.)

Treatment of Diarrhœa by Oxide of Zinc.—Dr. Jacquier has obtained good results, at Nantes, by administering oxide of zinc in cases of diarrhœa. The formula which he has employed is the following: oxide of zinc, fifty-four grains; bicarbonate of soda, seven and a half grains; in four packets, one to be taken every six hours. In all the cases which he observed oxide of zinc produced rapid cure of diarrhœa. In fourteen cases observed by Puygautier, the cure was exceedingly rapid, since in only one case were three doses of the medicine required. The results are considered to have been more satisfactory, inasmuch as in several cases the malady had endured from one to many months, and other methods of treatment had not produced any improvement. Thus it is held that oxide of zinc, although by no means to be considered as exclusive treatment for diarrhœa, deserves to be more generally known as

useful in that complaint. (*British Medical Journal*, Sept. 23, 1878.)

Chloride of Ammonium in the Treatment of Hepatic Disease.—Dr. Stewart finds that the action of ammonium chloride is more marked in cases in which the liver is actively congested, than in those in which there is chronic hepatitis. The full dose of chloride is twenty grains, which should be administered only after the skin has been rendered moist by the use of some simple diaphoretic mixture in repeated small doses. In cases of acute hepatitis, when this result is obtained the medicine should be at once commenced in twenty-grain doses, twice or thrice daily; its effects, which are marked and regular, being carefully noticed. These effects are a sensation of warmth spreading from the epigastrium over the whole body; the nervous system and the circulatory are exhilarated, the patient feeling “light-headed,” and at times drowsy. The acute pain previously complained of is sometimes referred to a point higher up towards the base of the axillary region instead of in the right hypochondrium as heretofore. In many cases the patient falls asleep, relieved of all distressing symptoms. These effects are produced within the first fifteen minutes after taking the medicine. During the next quarter of an hour a free and equable perspiration takes place over the entire surface of the body, which lasts for a period varying from one to two hours; whilst the pain is again felt in the original position, or it may have shifted down as low as the right hip. With succeeding doses the intervals of relief from pyrexia (in hepatitis) and pain referred to the part affected, as well as sympathetic pains in the shoulder, arm, &c., will gradually become longer, till ultimately, in favourable cases, the relief becomes complete and constant. After several doses of the medicine the urine is much increased in quantity, is limpid, and is passed without uneasiness. After a few days the appetite is much improved, and the patient craves for more food, which must be easily digested, but must in no case be solid. As regards the effects of chloride of ammonium upon the liver and adjacent parts, it is found that the peristaltic action of the alimentary canal becomes much more rapid and energetic, whilst the abdominal muscles may be thrown into tonic contractions, at the same time various symptoms are felt by the patient which cause him considerable uneasiness at the time, but which ultimately disappear. (*Brit. Med. Journ.*, Sept. 28, 1878.)

The Treatment of Psoriasis by Arsenic in Large Doses.—Dr. Lewis Shapter gives an account of several cases which he has successfully treated by the administration of arsenic in doses $\frac{1}{10}$ — $\frac{1}{2}$ a grain. The arsenic was given in the

form of arsenious acid, and was found to be useful when other means, such as carbolic acid and Donovan's solution, were ineffectual. Some physiological symptoms were induced, but of these comparatively slight notice is to be taken, and it is only if persistent and aggravated physiological effects are produced that the remedy is to be abandoned. Dr. Shapter suggests that the arsenic should be given in much larger doses than has been hitherto done, remarking that the required curative dose is only reached when some marked effect is produced on the disease. The first effects of the remedy are to make the cutaneous redness and scaliness more manifest; but this apparent increase of the disease, as well as trifling symptoms such as slight irritation of the conjunctiva or gastric pain, should only show the necessity for a continued use of the arsenic, and should not lead to its being discontinued. By the use of a large dose of arsenious acid a powerful nerve tonic is obtained, which can in many cases be administered without the objection of causing any of those physiological effects to which the use of either phosphorus or carbolic acid gives rise. It is therefore suggested that arsenic should be employed in large doses to continue the work begun by phosphorus or carbolic acid, if these drugs are chosen in the first instance in preference to arsenic. The arsenious acid was administered either in solution or in pill with bread-crumbs, since in this form the dose can be more easily regulated, while its combination with pepper, caustic potash, soda, and iron only tends to its rejection by the system. The external treatment during the administration of arsenious acid consisted solely in the preservation of cleanliness. (*The Lancet*, Oct. 1878.)

Camphor in Cases of Loss of Sleep.—In cases of melancholia with anxiety, camphor often exhibits a sleep-producing quality, when all other means have failed. Dr. Wittich administers 1—2 decigrams of camphor tinct. internally, or he injects the same dose in a solution of 1·0 tinct. camphor in 10·0 Ol. amygd. The injection is hypodermic, and a somewhat wider cannula than the ordinary is required. No evil effects follow its use. (*Berliner klin. Wochenschr.* 1878, No. 11.)

The Treatment of Heat Apoplexy with Ergot.—Dr. Dedrickson has successfully treated several cases of sun-stroke by means of ergot. The treatment consisted in the application of ice to the nape of the neck, and the administration of fifteen grains of liquid extract of ergot, and three minims of tincture of aconite every hour. The ordinary remedy of the East in cases of this kind is twenty grains of quinine: this was ineffectual in one of the cases in which the ergot proved beneficial. If the coma has advanced so far that the

patient cannot be made to swallow, Dr. Dedrickson suggests that ergotine may be injected subcutaneously. The aconite is to be omitted if the action of the heart is weak. (*Dubl. Jour. of Med. Science*, Oct. 1878.)

Cases Treated by the Application of Metals.—One case occurred in the Hôpital de la Pitié, in Paris. The patient, a married woman, suffering from pain in the knee-joint and difficulty in walking, was considered by Dr. Dumontpallier a susceptible subject for metalloscopic treatment. Four discs of copper were therefore applied to the left forearm in the morning; anæsthesia was present in the evening, and was rendered persistent by the application of four discs of zinc. Upon the application of eight discs of copper to the left knee, diminution of sensibility in the knee, symmetrical anæsthesia of the arms and legs, and anæsthesia of the whole body successively followed the application of the metal during a space of three days. There were also hysterical attacks, although the patient had not previously been subject to them; weakness was felt, and the sight became slightly troubled. Some days later sensation was completely recovered. On again trying the effects of the metal by an application of six discs of copper, a pricking sensation was felt below the discs, and there was anæsthesia extending symmetrically over both arms, accompanied on the day succeeding the application by violent cephalalgia. The second case occurred under the care of Dr. Hughes Bennett, at the Westminster Hospital. The patient was an unmarried woman, sensible and not impressible, who suffered from hemianæsthesia. Two zinc discs were applied to the right arm, which in common with all the muscles of the same side was anæsthetic and analgesic. In half an hour not only were the senses of touch and pain restored, but there was hyperæsthesia of the skin of nearly the whole limb. Next day this had disappeared. Discs of wood had precisely the same effect in inducing a return of sensibility as had the discs of zinc. The case is still under observation, and it should be noted that the action of various metals was not constant, for sometimes a metal which succeeded one day did not do so another. Dr. Bennett believes that the phenomena are due to the effects of expectant attention and the result of the manipulations acting on the body through the mind, and not to any special metallic action, as was known by the beneficial application of wood in place of metals. (*Brit. Med. Journ.* Oct. 12, 1878, p. 563.)

Hysteria simulating Chorea.—Mr. Bradford reports a case occurring in the Queen's Hospital, Birmingham, in which the patient suffered from pain in the lower part of her back, and general jerking movements of the muscles of the body. It was

elicited that the patient had some months previously seen a case of true chorea. The spine was found to be quite normal, and there was no affection of the facial or lingual movements; the cardiac and pulmonary organs were healthy, and there was no impairment of sensation in any part of the body. Prolonged and firm pressure over the left ovary caused pain, but arrested temporarily the movements. The application of an interrupted current caused cessation of the movements, the poles being placed over the sacrum, and over the left ovary, and then over either arm. The patient was assured that any return of the movements would require a stronger and more prolonged application of the battery. She was discharged the following day cured. The diagnosis of this case was founded on the fact that the lingual and facial muscles were not implicated, and that the patient had previously seen a case of true chorea. (*Brit. Med. Journ.* Oct. 12, 1878.)

Extracts from British and Foreign Journals.

Dracontium.—A New Treatment for Chorea.—In connection with a recent case of chorea in an adult female, the drug known as skunk cabbage, or dracontium, has been tried with good results. A saturated tincture of the rhizoma was prescribed in doses of ninety drops thrice daily. The supply of this drug for use should be obtained at the markets, and not at the drug stores. The best time to lay in a stock of dracontium is in the autumn, and it should be at once made up into the form of a tincture. The root must not be dried before using. The effects of the dracontium are probably due to some volatile principle which it contains. (*Boston Med. and Surgical Journal*, March 21, 1878.)

Recent Methods Suggested for the Treatment of Syphilis.—Professor V. Sigmund gives in clinical lectures delivered at Vienna, the chief methods that have been suggested in the course of the last decade for the treatment of syphilis, including both new remedies and the novel application of old remedies. Amongst the former he enumerates carbolic and salicylic acids, iodoform and the oleate of mercury. With the two first the professor has obtained excellent results, but he appears to have been less successful with iodoform. In regard to the oleate of mercury it has the advantage over ordinary blue ointment in that it is colourless, but is not otherwise more efficacious. He has not found any special benefit accrue either from the use of suppositories, or from the internal administration of the combination of mercury with sodium chloride (0.10 of sublimate and 2.0 parts of sodium chloride dissolved in 200 parts of water). On the other hand he approves of the combination of the sublimate with collodion in the proportion of 1 : 8–16. The internal administration of the combined oxides of mercury and iron is placed far below that of the alternate use of mercurial preparations and iron. He finds the inhalation of the sublimate only indicated as a local means in pharyngeal and laryngeal diseases, whilst it has little or no influence on the general or constitutional affection. As a prophylactic measure, V. Sigmund, like all dualists, regards the excision and subsequent application of caustic to the syphilitic induration as unnecessary

and injurious, without, however, objecting to operations for phymosis and paraphymosis when required. In regard to subcutaneous injections he has tried the sublimate, bityanide and calomel, which he considers to be appropriate and beneficial, whilst the phosphate, acetate, lactate, and biniodide are to be avoided. He places mercury-albumin injections with or without solution of common salt in the same category with the former series, but he thinks subcutaneous injections are only applicable to the slighter and simpler forms of syphilis, and on the whole of comparatively little value. In the treatment of syphilis balneo-therapeutics, change of air, &c., are of great importance. (*Correspondenzblatt*, No. 8. 1878.)

Apomorphia as an Emetic in Cases of Obstruction of the Œsophagus.—M. Verger administered two hypodermic injections of apomorphia to a child who had swallowed a plum-stone which stuck in the Œsophagus, and in whom ipecacuanha had failed to excite vomiting. The two injections represented a total dose of 2·5 milligrammes. Vomiting quickly occurred, and the foreign body was expelled. The child soon fell asleep, presenting evidence of muscular prostration and slight loss of intellectual power. The pulse was small, the respiration normal. Administration of coffee restored the child to its ordinary condition. (*Arch. Gén. de Méd.*, Oct. 1878.)

The Physiological Action of Purgatives.—Dr. L. Brieger, of Breslau, in treating this subject remarks that various views have been propounded in regard to the mode in which purgatives act in causing increased excretion from the bowels. Liebig advanced a purely physical theory of endosmose; Schmidt maintained the doctrine of exudation, whilst the researches of Thiry, Schiff, Buchheim, and Radziejewski show that in many instances neither transudation nor secretion are augmented, but that the increased peristaltic action urges forward the watery contents of the intestines so rapidly, that there is little or no time for the process of absorption to take place. "Is there," Brieger asks, "in most instances augmented transudation, or an increased secretion from the intestinal glands analogous to mercurial salivation or to the action of diuretics? and if there be increased transudation is there an osmotic attraction of water to the strongly charged saline contents of the intestine, or is there an obstruction to the passage of the venous blood, or does the nervous system exert some influence on the intestinal secretion?" In order to reply to these questions, Brieger followed the method of operating adopted by Moreau and Lauder Brunton. After the dog had been kept fasting for two or three days in order that the intestines might be as empty as possible, it was narcotised with morphia, and an incision was then made in the median line of the abdomen, below

the umbilicus, and a large portion of small intestine drawn out. This was placed on a warm moist cloth and ligatured at its two ends. A current of warm water was passed through its whole length to remove mucus and tænia. It was now divided into three parts by the application of two more ligatures, each piece being about eight inches long. The central portion was left free for the purposes of comparison, whilst the agent to be experimented on was injected with the other two. The results were as follows. Neutral salts in solutions containing one or two per cent. were simply absorbed. Magnesium sulphate when injected in from twenty to fifty per cent. solutions caused the loops to become tightly distended with a clear yellow thin alkaline fluid in which shreds of mucus were suspended. When boiled starch or cane-sugar was introduced into this fluid the presence of glucose was indicated by Trommer's reaction in the course of an hour and a half. Raw fibrine was dissolved in it, when it was withdrawn and retained at blood-heat, in the course of twelve hours. Microscopic examination showed that it contained no blood corpuscles, but many mucous corpuscles and epithelial cells; the mucous membrane was normal. Glauber's salt and common salt introduced in solutions of similar strength exerted a similar, though in the case of common salt, a less powerful influence. It hence appears that neutral salts cause water to be discharged into the cavity of the intestines and stimulate the glandular elements of the mucous membrane to exude an extremely dilute yet still active secretion, just as sugar stimulates the salivary glands. In the next place the effects of the introduction of drastic purgatives was tried, as Croton oil dissolved in ether and extract of colocynth dissolved in water. In small doses, as for example when 0·02 of a gramme of extract of colocynth were injected, the intestinal loop remained empty, contracted, and was slightly reddened. When larger quantities were introduced it was found to be distended with a bloody fluid and the mucous membrane to be inflamed. As in the case of the fluid exuded under the influence of the neutral salts, evidence was obtained of its diastatic action on starch, whilst fibrinous masses were speedily dissolved in it at blood-heat, and it was therefore true intestinal secretion. Under the microscope it was found to contain many white and red-blood corpuscles, very many intestinal epithelial cells, mucous and fibrinous flocculi. Drastic purgatives, therefore, when given in small doses excite peristalsis; in larger doses on the other hand they occasion inflammatory exudation and hypersecretion of the intestinal fluids. Amongst the laxantia he investigated calomel, infusion of senna, powdered rhubarb, aloes, gamboge, and castor-oil. After the introduction of these remedies the intestinal loops were constantly found to be empty and strongly

contracted, but the membrane, whilst everywhere presenting particles of the drugs, did not present the slightest indications of inflammation. The watery constituents of the injected fluids were always found to have undergone complete absorption. The whole of the castor-oil was, however, capable of being recovered. The action of laxatives therefore depends essentially upon the excitation of the peristaltic actions. (*Archiv. f. experim. Path. Pharm.* B. viii. H. 4 and 5.)

Treatment of Cancerous Growths by Ablation.—In a pamphlet on this subject, Mr. Mitchell Banks, of Liverpool, after referring to the necessity that existed before the introduction of anæsthetics to perform operations with rapidity, a necessity which often led to portions of the growth being left behind, points out the advantages we now possess in enabling large portions of tissue, and of the skin in particular, to be removed, and dwells on the necessity of a much more free removal of the diseased part than is usually adopted. In the case of the breast, and in that of the jaw, not only should the primary tumour be ablated, but he advocates the extirpation of all glands that exhibit the least tendency to swelling or hardness. He records several cases in which this proceeding was adopted with success. (Pamphlet, 1878.)

Therapeutic value of Anemone Pulsatilla. — In a paper on this subject, Dr. Henry G. Piffard states that the varieties of anemone, which is a genus of the Ranunculaceæ, in use in medicine are four in number, the *A. pulsatilla*, *A. pratensis*, *A. nemorosa*, and *A. ludoviciana*. The anemones were used by Galen, Paulus Œgineta, and Avicenna, and from their writings it appears to have been esteemed in diseases of the eye and skin, in derangements of the menstrual function, and as a galactagogue. Störck revived the reputation of anemone during the latter part of the last century. Mr. A. W. Miller (*Am. Journ. of Pharm.* vol. xxxiv. 1862) states that numerous experiments instituted by W. H. Miller, of St. Paul, Minnesota, on the *Anemone ludoviciana*, have served to establish the value of this remedy in many chronic diseases of the eye, particularly cataract, amaurosis, and opacity of the cornea; very decided advantage was also experienced from its employment in cutaneous eruptions and secondary syphilis. A tea of the dried flowers and herb was sometimes used as well as the juice of the fresh plant bruised and expressed, and then either preserved by the addition of one-fourth of its weight of alcohol, or evaporated to the consistence of an extract. In preparing the latter the presence of some volatile acrid principle was clearly manifest by the highly irritating vapours arising from the juice on the application of a gentle heat, producing a very painful impression on the eyes of

the operator. That this volatile substance is dissipated by drying is proved by the taste of the dry flowers, which is simply sweetish and herbaceous, that of the beans being more astringent, with very slight acrimony, while in the recent state both are exceedingly irritating and acrid. The odour of the dried plant is faint and slightly camphoraceous. The active principle of the genus anemone is a neutral body named anemonin, which is volatile, crystallisable, soluble in hot water and hot alcohol, from which it is deposited on cooling. It is an acrid substance, and the melted crystals applied to the tongue produce a pricking and stinging sensation, and leave after them white spots like those caused by escharotics. Dr. Piffard has tried the remedy in dysmenorrhœa and in epididymitis, and has arrived at the conclusion that the tincture of the fresh plant or its active principle should alone be used; the dose being 1 millig. (1-65th of a grain.) (*The New York Medical Record*, Vol. 13, No. 11, 1878.)

Modification of Politzer's Method of Inflating the Tympanum.—Dr. Osecroft Tansley finds that a slight modification of a plan suggested by Dr. E. Holt succeeds well in practice. Dr. Holt's method consists in doing away with the necessity of swallowing water. He found by taking a full inspiration and filling the mouth and throat tensely with air and then discharging the air-bag as in Politzer's method, that air readily entered the tympanum. This is equally effective with the old plan, and it is acknowledged by the patients to be much more agreeable. Dr. Tansley states that he at first followed Dr. Holt's suggestion implicitly, and directed his patients to fill their mouths and throats tensely with air; but he has succeeded better by telling them simply to pucker up their lips and blow from their mouth, in the same way as they would to blow out a candle, and at the same time refrain from letting air pass through their noses. Then placing the nozzle of the air douche in the nostril, and retaining it *in situ* with the thumb and first finger, he at the moment of Politzerizing closes the other nostril with the second finger, and generally succeeds at the first attempt. (*New York Medical Record*, No. 11, vol. xiii. 1878.)

An Analysis of 112 cases of Diphtheria.—Dr. George Van Wagenen, of Newark, N.J., gives a good analysis of the investigations he has made in respect to a large number of cases of diphtheria that have fallen under his notice during the past four or five years in New York and its vicinity. In regard to its origin he thinks it may fairly be classed among the filth diseases, and he gives some good cases where he was able to trace it to water contamination. In regard to the part of the dwelling in which cases occurred, one-third of all the cases occurred on the first floor; and one-fourth of all the cases occurred on

the first floor without cellar, and he concludes that dampness with filth is a most powerful predisposing cause. In regard to time of year, if the year be divided into a warm dry season from April to September, and a cold damp season from October to March, he finds in the warm and dry season 37 cases; in the damp and cold 75 cases. December had the largest numbers, 26. June and July the least, each having 3. Hence the diphtheritic poison follows the season of scarlatina and morbilli, rather than that of the summer zymotics. In regard to its contagiousness, he thinks his inquiries show that it is very contagious, and further that a malignant case will *usually* produce a malignant case, milder poison milder ones. In regard to sex and age 50 were males, 62 females, 43 or $\frac{1}{3}$ were under five years old, and 74 or $\frac{2}{3}$ under 10 years. The 112 cases occurred in 50 households, in 1 case in 25 households; in two cases in 13; 3 cases in 7; 4 cases in 1; 5 cases in 1; 7 cases in 1; 9 cases in 1; and in 12 cases in 1. There were no escapes in 16 households; 1 escape in 14; 2 escapes in 13; 3 escapes in 3; and 4 escapes in 2. Of all the cases 32 or $\frac{1}{4}$ were malignant; 46 or $\frac{1}{2}$ were mild, and 33 presented diphtheritic throat, with little constitutional disturbance. In 104 cases the deposit began on the tonsils or some part of the pharynx. In 4 the deposit began in the nares, and in 4 in the larynx. The number of deaths was 17 or about $\frac{1}{4}$ th. The danger of death bore a marked ratio to the severity of the symptoms. In regard to the manner of death 2 died from septicæmia alone; 2 from eclampsia; 2 from cardiac paralysis; 10 from asphyxia, and 1 from asthenia. Sequelæ occurred in 11 cases. In 10 of them there was paralysis of the pharynx; in 7 paralysis of the larynx; in 6 of the limbs; in 2 of the heart, and in 2 there were rheumatic pains. The average duration of the membranous deposit on the throats of those who had sequelæ was $12\frac{1}{2}$ days. The temperature was highest at the onset, averaging 102° — 103° F.; the highest being $106\frac{1}{2}^{\circ}$ F. The treatment adopted had in view to cause suppuration in the membrane; to thoroughly disinfect the air and to overcome the asthenia which was always present. The first indication was fulfilled by making the patient inhale the vapour of hot water and by the application of hot poultices to the neck. For disinfection of the air salicylic and sometimes carbolic acid was used with a spray in a steam atomizer. For diet and as restoratives milk and beef tea, milk punch, quinia and iron and quinia citrate were employed. (*New York Medical Journal*, June, 1878.)

The Treatment of Ulcers by means of the Elastic Bandage.—The treatment of varicose and other chronic ulcers of the leg is so generally unsatisfactory that any new method promising favourable results is to be hailed with delight. The

latest novelty is the use of the strong elastic bandage, with which Dr. Henry Martin claims to have cured over six hundred cases without a single failure. The bandage is of "pure rubber," ten-and-a-half feet long, three inches wide, and thickness number twenty-one "Stubs' wire gauge." The length and breadth may vary with the size of the limb, but this is the most desirable thickness. It is applied by winding one turn just above the malleoli, then one around the instep and sole, then spirally up the leg to the knee, where it is fastened by tapes attached to the end of the bandage for that purpose. If it is desirable to apply it as far as the groin, a bandage eighteen to twenty feet long will be necessary. At night the bandage is removed and the ulcer protected by a piece of oiled linen, or some equally simple dressing. In the morning all traces of oil or cerates must be carefully removed, as fatty matter tends to injure the rubber, and the bandage should be reapplied before leaving the bed. It should be supplied with just sufficient snugness to prevent it slipping down, and the increase of blood in the veins on standing will cause it to become of the exact degree of tightness. The bandage keeps the leg warm, moist, and air-tight, conditions most favourable to granulation and cicatrization, and in addition the gentle even pressure so supports the distended and weakened vascular coats as to prevent that venous congestion so frequently the cause of the malnutrition of skin. For the first one or two weeks a papular eruption appears under the bandage caused by obstruction to the cutaneous follicles. The bandage is their best treatment. In non-specific ulcers no other local treatment is necessary. The circulation of the limb is not stopped, but, owing to the support given to the vessels, is facilitated, thus there need be no fear of causing œdema of the foot—on the contrary, the œdema which so constantly accompanies varicose ulcers is rapidly absorbed. The occurrence of œdema indicates the improper application of the bandage.

The use of this apparatus is not confined to the treatment of ulcers; injuries and diseases of the joints, especially of the knee and ankle, are equally benefited. In sprains the strong elastic bandage wound round a joint affords a constantly present substitute externally for the disabled ligament. The constant pressure induces a rapid absorption of the exudation among the tissues about the seat of the injury, and the gentle equable warmth and moisture, which always accompany its application, have a most favourable effect in alleviating and preventing inflammation. In diseases of the joints, marked by effusion, the application of the bandage after aspiration has been followed by complete success. In these cases the bandage should be applied day and night for six to eight weeks. Its use is also

recommended in disease of bursæ mucosæ, œdema, erysipelas, and erythema, cutaneous affections, and as a radical cure for varicose veins; in the latter case it is supposed to act by causing adhesion of the walls of the vessels and their consequent obliteration. (*Canada Lancet*, June 1, 1878.)

The Treatment of severe Bed-Sores.—Dr. Dyce Duckworth desires to call attention to some methods of dealing with severe bed-sores, in those cases which no treatment has availed to avert, and which come at once under the care of the practitioner. The worst instances are met with in heavy patients, with flabby and imperfectly nourished integuments. Dr. Duckworth wishes to recommend that in addition to the use of the water bed the patient should lie with the buttocks and sacrum constantly upon poultices. These poultices should be made of linseed (or as termed in the United States, flax meal), and if there be much discharge or fœtor, the cataplasma carbonis of the pharmacopœia should be used. The poultices must be large, so as to cover all affected parts, frequently renewed, and if there be excavated sores over the trochanters, these must be also covered and a binding sheet secured over the abdomen with safety pins. In the case of there being any sloughing portions of muscular and fibrous tissue in the wounds, and also if the wounds be flabby or languid, the addition of balsam of Peru to the poultice becomes highly desirable. If there be deeply excavated sores, plugs of lint smeared with the balsam should be placed in the cavities, and the edges of the wound be greatly compressed by strips of diachylon plaster. If the wounds become unduly vascular or granular, dossils of lint dipped in zinc or copper sulphate lotion (two grains to the ounce) are very useful for a time, and should be placed in the cavities as described. It will be found necessary to persevere with the poultices till the bed-sores heal, and this is sometimes a matter of many months. Quinine, in doses of two or three grains thrice daily, is of service in the treatment of the general constitutional condition of such patients, but of course any other medicinal treatment can be carried out if required for the special lesions which have led to the complication. (*Archives of Dermatology*, New York, July 1878.)

Atropia in Coliapse.—Dr. J. T. Hodgen, of St. Louis, has for the last twelve years used atropia in collapse, and has found it an admirable remedy, having used it in cases of collapse in malarial fevers, also in collapse from strangulation of the intestine, and many times in cholera. In sixteen cases of cholera, all in profound collapse, blue, cold, shrivelled, and pulseless, some with rapid irregular and difficult breathing, the following practice was pursued. Dr. Hodgen injected into the areolar

tissue from one-sixtieth to one-thirtieth of a grain of atropine. In four cases there was no perceptible effect; the patients all dying in from three to sixteen hours. In two cases within an hour the pulse became perceptible and distinct, the skin warm, even red; one of these died in eight the other in fourteen hours. In three cases reaction was pretty well established within an hour after the injection of atropine, but all three died. Seven of the sixteen patients treated with atropine recovered, six of them rapidly and completely. In one case of the six, the patient took by injection half a pint of the infusion of buchu, one ounce of buchu with half an ounce of common salt to the gallon every half hour for twenty-four hours. During this time, though the tea was retained, she had three dark bilious evacuations, having taken a large quantity of calomel. The kidneys acted freely, and twenty-four hours after Dr. Hodgen first saw her, no one would have supposed she had had cholera, so complete was the recovery. The seventh case did not recover so promptly. This was an exceedingly sensitive nervous woman, of strong will, who determined not to die. This case responded promptly to one-fortieth of a grain of atropine. Water was allowed as a drink, and warm water and sometimes beef-tea injected into the bowels. After two relapses, atropine was injected for a third time, and the pulse responded; urine was discharged abundantly, and the patient recovered rapidly. Atropine diminishes the irritability of the spinal cord; produces a rapid contraction of the engorged vessels of the conjunctiva, and stimulates the action of the sympathetic. The injection of saline solutions into the bowels is sufficiently indicated by the loss sustained by the blood. Dr. Hodgen does not believe atropine will *cure* any case of cholera, but he believes its judicious use will so relieve the congestion consequent upon the action of choleraic poison, that remedies may be introduced into the system; that we are enabled to replace the lost serum of the blood by the best substances known to us, and that in cases where the poison has already been eliminated and the patient is in danger of death from simple exhaustion, so that this affords us an opportunity of supplying the waste and thus saving the patient. (*St. Louis Med. and Surg. Journal*, May 1878.)

Therapeutic action of the Chlorhydrate of Pilocarpine.—Pilocarpine is the active principle of jaborandi. This last is a remedy that has powerful sudorific and sialogogive properties; it has, however, a disagreeable taste, and distresses the stomach, producing nausea, vomiting, and sometimes colic. It also occasionally produces vertigo and fainting. It was natural then that a more surely acting agent should be looked for in

its active principle, which, at first named jaborandine by Byasson, has been obtained in a more pure condition, and entitled Pilocarpine by M. Hardy. The action of this has been the subject of two theses, one by Dumas (1875), and the other by Kercéa (1877). Dr. Metaxas has recently been employing it with advantage in his ophthalmological clinic, and the results of his experiments have been published by Dr. Alexandroff. He has found that it may be advantageously employed in the form of endermic injection in rheumatic iridochoroiditis and iritis, and to be especially useful in affections of the vitreous. The effects observed by Dr. Alexandroff were as follows: The quantity injected being five drops of a solution containing 10 per cent. of pilocarpine, *i.e.* about 2 centigrammes, salivation manifested itself about the second minute after injection, sweating occurred about the third minute, commencing always about the head. The ptialism was always preceded by heat and congestion of the face. In all instances diarrhœa was experienced. Epiphora was constant, and was accompanied by hyper-secretion of the nasal mucous membrane. No galactagogue influence was observed. The menstrual function was unaffected. In one case the renal secretion was augmented, but in the remaining thirty-nine cases it remained normal. The pulse invariably augmented in frequency immediately after the injection, and then gradually sank. The pupil became contracted. Rigors were sometimes observed, and præcordial pain. (Pamphlet, 1877.)

Ergot in Atony of the Bladder.—Profs. Langenbeck and Israel state that they have obtained excellent results in certain cases of atony of the bladder with hypertrophy of the prostate, by means of subcutaneous injections of ergot (12 centigrammes of the solution of Bonjan). The improvement was very marked after one, two, or three injections. A patient under the care of Israel, who was unable to retain his water for more than ten minutes, and who was thus treated, was able to hold it for three hours. (*Gaz. des Hôp.* Mars 2, 1878, and *Imparziale*, No. 9, 1878.)

Mode of Employment of Extract of Ergotin in Hypodermic Injections.—The solution recommended is so concentrated that one gramme corresponds to two of the powder, and is said to succeed well. It does not irritate the subcutaneous connective tissue, and forms neither eschars nor abscesses. Administered in this mode the stimulant action of ergotin over the uterus is most marked and persistent. It has been found useful in cases of severe hæmorrhage from the lungs, as well as from the uterus. (*Imparziale*, No. 9, 1878.)

Treatment of Neuralgia by Hypodermic Injections of Ergot.—Marino recommends the injection of from 0·15 to 0·25 gr. dissolved in six grains of distilled water. This may be repeated once or twice, though perhaps not more than six times, and acts well in certain forms of neuralgic pains, especially in tic douloureux. It appears to act less favourably in sciatica. (*Imparziale*, No. 8, 1878.)

Action of Salicylic Acid and the Salicylates.—Chirone and Petrucci have made a series of experiments on these remedies, and have arrived at the following conclusions: Both salicylic acid and the salicylates have the same biological action, but with the first local, with the latter general, conditions are of most importance. Salicylic acid both free and as a salt, lowers, in small doses, the temperature, though not to any great extent. In large doses it not only does not depress it, but it actually augments it to a very marked extent. Animals submitted to the daily consumption of the acid, or of its salts, become rapidly thinner, and lose weight. The beats of the heart in the frog are increased in frequency after the use of salicylate of soda, but in mammals they are sometimes reduced, sometimes increased in frequency, apart from the absolute dose administered, but with salicylic acid the frequency of the beats is always reduced. Lastly, salicylic acid constantly diminishes the frequency of the respirations, whilst salicylate of soda first augments and then reduces them. (*Commentario Clinico*, Pisa, No. 14, 1878.)

On the Antagonism between Alcohol and Strychnia.—Dr. Stacchini, from observing some cases where the administration of alcohol seemed to be of service in arresting the action of strychnia, was led to investigate the question whether there was any real antagonism between them: he experimented on frogs, guinea-pigs, and dogs. His results were essentially negative; he found that alcohol cannot be regarded as antagonistic to strychnia. Alcohol, nevertheless, produces considerable diminution in the violence of the convulsion, and retards the access of death under circumstances that would otherwise prove fatal. Animals die after the lapse of a longer or shorter period, notwithstanding the absorption of a large amount of alcohol, if the doses of strychnia have been sufficiently considerable. Alcohol is perhaps the least dangerous of the remedies that are used in strychnia-poisoning, its own action, either injected in a diluted form, or injected subcutaneously, is certainly less dangerous than that of chloral introduced in the same way. A fatal dose is not interfered with by strychnia, nor does strychnia seem to modify the inebriating effects of alcohol. If alcohol and strychnia are given together in an absolutely fatal dose, the

animal dies, presenting the combined symptoms of both. (*Gazzetta Med. Ital. Imparziale*, No. 9, 1878.)

A New Revulsive.—Among the usual medicines there are few which render as much service as revulsives. Sinapisms are of daily use, and flying blisters, although reserved for graver cases, have also numerous indications. But there are many circumstances where the transient action of the sinapism does not suffice, and where we hesitate before employing the blister. We have, then, no other recourse than frictions with tartar emetic or croton oil, and applications of thapsia. Tartar emetic produces an eruption, which heals slowly and leaves indelible traces. Croton oil and thapsia occasion intolerable itching, painful swelling, and a general eruption, and their action is slow to produce. Burgundy pitch is almost useless. What is required to answer the purpose is an agent whose action is at once rapid and prolonged, and which provokes a sharp revulsion without pain or itching. This agent is pimento, or rather its extract, which has just been made known by M. Lardy. It unites in effect in the highest degree the diverse conditions which have been enumerated. It acts with great rapidity in ten to twenty minutes, according to point of application and delicacy of the skin. Its action from the first is manifested by heat, slight smarting, and redness. These phenomena increase for about three hours, then remain stationary, and the revulsive action continues as long as desired. After twenty-four hours, however, in adults, and eight or ten hours in children, it is best to remove the plaster, or put another in a new place, if further revulsion is desired. The heat and smarting caused are not painful, and do not hinder the patient from his occupation. There is no itching, and the action always remains localised. It may well be compared to that of mustard arrived at the half of its power, and thus remaining for twenty-four hours. The colour of the extract is a beautiful red; when properly incorporated with some plastic mass, and spread on squares of paper, its application is easy. It is not necessary to heat it, as it adheres readily. Its action is augmented by pressure. After removal, the heat and smarting may be relieved, if desired, by the application of starch. Care should be taken not to bring it in contact with the eyes, lips, or nose, on account of the smarting caused by it in those regions. (*The Chicago Med. Journal and Examiner*, April, 1878.)

Notes and Queries.

HEWLETT'S LIQUOR SANTAL FLAVA CUM BUCHU ET CUBEBA.—In our notice of this medicine in last number we omitted to state that this preparation which we have had tried, and which has been found to have the same extraordinary power of arresting gleet as sandal oil itself, as well as of mixing with water, and being by no means disagreeable, is prepared by Messrs. Hewlett and Co.

RICANIC EMULSION.—We have received from Messrs. Gale and Co. a preparation of castor oil bearing this name. The only bar to the extensive employment of castor oil is its abominable taste, and this is well disguised in the preparation before us.

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* * Any of the foreign works may be procured on application to Messrs. DULAU, of Soho Square, W.C.; WILLIAMS and NORGATE, of Henrietta Street, Covent Garden, W.C.; or BALLIÈRE, of King William Street, Charing Cross.

Department of Public Health.

SANITARY LEGISLATION IN THE PAST SESSION (1878).

THE past Session of Parliament will be memorable for the legislation it accomplished affecting the sanitary welfare of the people, not only in respect to the particular nature of the legislation, but also in regard to the manner in which some parts of it were affected. Four Acts received the sanction of the legislature touching sanitary matters, namely, the Public Health (Water) Act, 1878; an Act to amend the law relating to Baths and Washhouses; the Contagious Diseases (Animals) Act, 1878; and the Factory and Workshop Act, 1878. The first-named Act rectifies one of the most important defects of the Public Health Act, 1875; the second-named removes certain difficulties which had been experienced in the administration of the Acts relating to baths and washhouses; the third-named repeals the Acts relating to contagious diseases among animals previously in force in the United Kingdom, and substitutes a more comprehensive measure for them; and the fourth-named consolidates and amends the Acts relating to factories and workshops.

It is remarkable that the first of these Acts, although relating to a cardinal question of water-supply, was introduced into the House of Commons by private members, avowedly on account of the unwillingness of the Government to take the measure in hand, and the subsequent acceptance of the measure by both Houses of Parliament indicates either that the Government, when refusing to introduce a measure on the subject, either misjudged the feelings of the legislature with regard to it, or that they were actually unwilling to meddle with it. Certainly,

when the measure was brought forward the Government did not oppose it, and, indeed, eventually they gave it their support. Not the less does the fact remain that this measure, effecting one of the most urgently needed and widely felt reforms in sanitary legislation, and which ought to have emanated from the Government, was brought forward in the first instance virtually against its wishes.

Again, the Contagious Diseases (Animals) Act, contains a provision for the regulation and inspection of drains, cow-sheds, and milkshops, in view of preventing the dissemination of infectious diseases (human) through the agency of these places, which is preposterously out of place there, and which should have had a place in the Public Health Act, 1875, or rather in an amendment of that Act. The administration of the Contagious Diseases (Animals) Act, and of this provision of it, is placed under the supervision of the Privy Council, and deputed to local authorities, who, except in the case of municipal corporations, are *not* in England sanitary authorities. In other words, with the exception named, the supervision of dairies, cow-sheds, and milkshops for public health purposes, is by the Act expressly removed from the sanitary authorities and given to other authorities who have, as a rule, not only no public health responsibilities in the sense that sanitary authorities have, but have actually no means provided for them of exercising the supervision entrusted to them in this particular instance in a way to meet public health requirements. What does this mean? It can only mean one thing, to wit, that the Local Government Board has been shunted by the Privy Council, with the assent of the Government, in a matter which especially concerns its duties—in other words, that the Government, having thrown local administration into almost hopeless confusion, are themselves falling into confusion as to central sanitary administration. It only needed this to make the frustration of the Local Government Board Act, 1871, and Public Health Acts, 1872 and 1875, complete.

The Public Health (Water) Act, 1878 (41 and 42 Vict., ch. 25) is a short Act of thirteen sections. Section 1 provides for its title being as given above, and that it shall be construed as

one with the Public Health Act, 1875; and section 2 provides that the Act shall come into operation on the 25th day of March 1879. Section 3, which contains the main purpose of the Act, provides as follows:—

“It shall be the duty of every rural sanitary authority, regard being had to the provisions in this Act contained, to see that every occupied dwelling-house within their district has within a reasonable distance an available supply of wholesome water sufficient for the consumption and use for domestic purposes of the inmates of the house.

“Where it appears to a rural sanitary authority, on the report of their inspector of nuisances, or their medical officer of health, that any occupied dwelling-house within their district has not such supply within a reasonable distance, and the authority are of opinion that such supply can be provided at a reasonable cost not exceeding a capital sum the interest on which at the rate of five per centum per annum would amount to twopence per week, or at such other cost not exceeding a capital sum the interest on which at the rate of five per centum per annum would amount to threepence per week, as the Local Government Board may on the application of the local authority determine under all the circumstances of the case to be reasonable, and that the expense of providing the supply ought to be paid by the owner or defrayed as private improvement expenses, proceedings may be taken as follows:—

“(1.) The authority may serve on the owner of the house a notice requiring him, within a time specified in the notice and not exceeding six months from the date of the service thereof, to provide such supply, and to do all such works as may be necessary for that purpose.

“(2.) If at the expiration of the time so specified the notice is not complied with, the authority may serve on the owner a second notice, informing him that if the requirements of the first notice are not complied with within one month from the date of the service of the second notice, the authority will themselves provide such supply, and that the expense of providing the supply will in that case be payable by the owner or as a private improvement expense.

“(3.) If at the expiration of one month from the date of the service of the second notice the requirements of the first notice are not complied with, the authority may, subject as in this Act is mentioned, themselves provide the supply, and for that purpose they may enter upon the premises and execute all such works as appear to them necessary for obtaining a supply of water for the house, and for the purposes of such entry sections 102 and 103 of the Public Health Act, 1875, shall apply until the works are completed, in the same manner as if an order of a court of summary jurisdiction had been made for the abatement of a nuisance on the premises, and that order had not been complied with.

“(4.) Any expenses incurred by the authority in providing such supply and doing such works may, when the supply has been provided, be recovered in a summary manner from the owner of the house, or may, at the option of the authority, be declared, by their order, to be private improvement expenses.

“(5.) Where the owners of two or more houses have failed to comply with the requirements of the notices served on them under this section, and the authority might, under this Act, execute the necessary works for providing a water supply for each house, the authority may, if it appears to them desirable, and no greater

expense would be occasioned thereby, execute works for the joint supply of water to those houses, and apportion the expenses as they deem just.

“The authority may, on cause being shown to their satisfaction why the requirements of a notice served by them under this section should not be complied with, withdraw the notice or modify the requirements thereof.

“Provided that nothing in this section contained shall be deemed to relieve the authority from the duty imposed upon them by the Public Health Act, 1875, of providing their district or any contributory place or part of a contributory place therein with a supply of water in cases where danger arises to the health of the inhabitants from the insufficiency or unwholesomeness of the existing supply, and a general scheme of supply is required, and such supply can be got at a reasonable cost.”

Section 4 provides that the owner of a house may appeal against the notice of a rural sanitary authority to provide a supply of water for his house on any of the following grounds, namely, (1) that the supply is not required ; or (2) that the time limited by the notice for providing the supply is insufficient ; or (3) that it is impracticable to provide the supply at a reasonable cost ; or (4) that the authority ought themselves to provide a supply of water for the district or contributory place in which the house is situate, or to render the existing supply of water wholesome ; or (5) that the whole or part of the expense of providing the supply, or of rendering the existing supply wholesome, ought to be a charge on the district or contributory place. It shall not be lawful for the authority to proceed with the execution of the works, any of these objections being urged, without as regards objections 1, 2, and 3, the order of a court of summary jurisdiction, and as regards 4 and 5 an order of the Local Government Board. Section 5 provides for an appeal against the apportionment of expenses for a joint supply of water furnished by a rural sanitary authority for two or more houses by the owners thereof.

Sections 6 and 7 provide as follows :—

“It shall not be lawful in any rural district for the owner of any dwelling-house which may be erected after the date of the commencement of this Act, or of any dwelling-house which after that date may be pulled down to or below the ground floor and rebuilt, to occupy the same, or cause, or permit the same to be occupied, unless and until he has obtained from the sanitary authority of the district a certificate that there is provided, within a reasonable distance of the house, such an available supply of wholesome water as may appear to such authority, on the report of their inspector of nuisances or of their medical officer of health, to be sufficient for the consumption and use for domestic purposes of the inmates of the house.

“If the sanitary authority refuse to grant such certificate, the owner may apply to a court of summary jurisdiction for an order authorising the occupation of the house notwithstanding the refusal of the certificate, and thereupon the court shall summon the authority, and if the court, after hearing the case, is of opinion that the certificate ought to have been granted, the court may make an order authorising the occupation of the house.

“Any owner who occupies a house or causes or permits it to be occupied in contravention of this section shall be liable on conviction by a court of summary jurisdiction to a penalty not exceeding ten pounds.

“It shall be the duty of every rural sanitary authority from time to time to take such steps as may be necessary to ascertain the condition of the water supply within their district, and the authority may pay all reasonable costs and expenses incurred by them for the purpose of taking such steps. The authority, or any of their officers, or any person duly authorised in writing for that purpose by the authority, if they or he have or has reasonable ground for believing that any occupied dwelling-house within the district is without a proper supply of wholesome water, sufficient for the consumption and use for domestic purposes of the inmates of such house, shall be admitted into the premises for which such supply is required or from which the water supply may be derived for the purpose of ascertaining whether or not such house has such a supply within a reasonable distance; and for the purposes of any such admission sections 102 and 103 of the Public Health Act, 1875, shall apply in the same manner as if such admission were necessary for the purpose of examining as to the existence of any nuisance on the premises, and the person so authorised as aforesaid were an officer of the rural sanitary authority.”

Section 8 provides for the Local Government Board determining what is “a reasonable cost” within the meaning of section 62 of the Public Health Act, 1875.

Section 9 runs as follows:—

“Where a rural sanitary authority have provided a stand-pipe or stand-pipes for the supply of water to any portion of their district, they may recover water-rates or water-rents from the owner or occupier of every dwelling-house within two hundred feet of any such stand-pipe, in the same manner in all respects as if the same had been given on the premises.

“Provided that if any such dwelling-house has, within a reasonable distance, and from other sources, a supply of wholesome water sufficient for the consumption and use of the inmates of the house, no water-rate or water-rent shall be recoverable from the owner or occupier of the house unless and until the water supplied by the authority by means of such stand-pipes is used by inmates of the house.”

Section 10 gives power to any ten persons rated to the relief of the poor in an urban district, or to any five persons so rated in a contributory place, where the sanitary authority under the provisions of the Public Health Act, 1875, as amended by the present Act, supply water, to require the authority to levy water-rates or water-rents, and it is made incumbent upon the

authority so required to exercise the power they possess to this effect under the Public Health Act, 1875, and the present Act.

Section 11 provides that the Local Government Board may, if they think fit, by order, invest any urban sanitary authority with all or any of the powers and duties which are by this Act given to a rural sanitary authority, and such investment may be made either unconditionally or subject to any conditions to be specified by the Board as to the time, portion of the district, or manner during, at, or in which the power and duties are to be exercised.

The remaining two sections relate to the forms given in the schedule attached to the Act, and to the powers given by the Act, being in addition to, and not in derogation of, any other powers conferred by Act of Parliament, law, or custom.

The Act to amend the Law relating to Public Baths and Washhouses (41 Vict., ch. 14) is also a short Act of fourteen sections which enables urban sanitary authorities to provide covered swimming baths, to make all necessary regulations for their use, and to appoint and pay needful officers. The Act also empowers the authorities to close the swimming baths, whether covered or open, for a period not exceeding five months, from the beginning of November to the end of the month of March, and in the interim to use the inclosure for the establishment therein of "a gymnasium or such other means of healthful recreation as they shall think fit, or they may during such period allow the covered or open bath to be used as an empty building for such purposes of healthful recreation or exercise as they shall think fit, and may at any time allow any portion of the public baths not required by the authorities to be used for vestry meetings or other parochial purposes." It is forbidden, however, that any covered or open swimming bath when closed shall be used for music or dancing. The baths in question, as well as any baths or washhouses established under the Acts relating thereto, are made by section 10 of the present Act, public and open places, so that any offences committed against decency therein become criminal. The Act may be cited as the "Baths and Washhouses Act, 1878."

The Contagious Diseases (Animals) Act, 1878 (41 and 42 Vict., ch. 74), and Factory and Workshop Act, 1878 (41 Vict., ch. 16), do not admit of being abstracted within the space at our disposal. The former Act has 88 sections, the latter 107. The provisions of both need to be read in detail for their proper apprehension. A description of the general arrangement of the sections will, however, convey some notion of the comprehensiveness of the enactments.

The Contagious Diseases (Animals) Act, 1878, is divided into four parts. The first part contains certain general provisions. The second part relates to England and defines the power of the Privy Council under the Act, prescribes the local authorities to whom the execution of the Act is entrusted, and then in succession recites the measures provided in the Act in relation to cattle-plague, pleuro-pneumonia, and foot-and-mouth disease. Then follow provisions relating to exceptional powers for transit of animals, to infected places and areas generally, to the slaughter of diseased animals and compensation for the same to, notice of disease to the police, to the prevention of contagious diseases among, and the movement of animals generally to, dairies, cow-sheds, and milk-shops, to foreign animals, to the power and duties of local authorities, to their expenses, and to borrowing by them, to the duties and authorities of the police, to certain general powers, and finally to offences and proceedings. Part three contains provisions applying the Act to Scotland; and part four contains provisions applying the Act to Ireland. The part of the Act which more particularly concerns this journal is that which relates to dairies, cow-sheds, and milk-shops. Section 34 provides as follows:—

“The Privy Council may from time to time make such general or special orders as they think fit, subject and according to the provisions of this Act, for the following purposes, or any of them:—

“(1.) For the registration with the local authority of all persons carrying on the trade of cow-keepers, dairymen, or purveyors of milk.

“(2.) For the inspection of cattle in dairies, and for prescribing and regulating the lighting, ventilation, cleansing, drainage, and water-supply of dairies and cow-sheds in the occupation of persons following the trade of cow-keepers or dairymen.

“(3.) For securing the cleanliness of milk-stores, milk-shops, and of milk-vessels used containing milk for sale by such persons.

“(4.) For prescribing precautions to be taken for protecting milk against infection or contamination.

“(5.) For authorising a local authority to make regulations for the purposes aforesaid, or any of them, subject to such conditions, if any, as the Privy Council may prescribe.”

If these provisions had been made as an amendment of the Public Health Act, 1875, nothing could well have been more satisfactory. Their execution would then have become part of the functions of the sanitary authorities generally, who alone can make an intelligent application of them. The local authority referred to in the provisions is the justices in Quarter Sessions assembled for counties, or the Corporation of London in the City of London, or the Metropolitan Board of Works for the Metropolis other than the City, or Municipal Councils, or improvement commissioners in boroughs, or the Local Board in Oxford, as the case may be. With the exception of the Corporation of London, municipal councils and certain improvement commissioners, and the Local Board of Oxford, the authorities referred to do not exercise sanitary functions under the Public Health Act, and the tendency of the provision is to dissociate one of the newest and most difficult duties of sanitary administration, a duty particularly dependent for its intelligent administration upon a skilled knowledge of the circumstances which have rendered the provision necessary, from the one sanitary official capable of executing it, namely, the medical officer of health. This difficulty may be avoided in the case of the urban sanitary authorities who become local authorities for the Act, and even the county local authority may in a fashion obviate the difficulty if it chooses to exercise the large power given to it for appointment of inspectors under section forty-two. But nothing can well compensate for dissociating these essentially sanitary provisions from the general sanitary administration of the kingdom, and for this arbitrary creation of another and fragmentary sort of sanitary authority. Let us hope, however, that the orders to be issued by the Privy Council under section 34 may in some sort reconcile these difficulties.

The Factory and Workshop Act, 1878, is divided into three parts. The first part gives the general law relating to factories and workshops, and it contains seven subsections relating to (1) sanitary requirements, (2) safety, (3) employment and meal hours, (4) holidays, (5) education of children, (6) certificates of

fitness for employment, and (7) accidents. The second part contains the special provisions relating to particular classes of factories and workshops, and is divided into five subsections relating to (1) special provisions for health in certain factories and workshops; (2) special restriction as to employment, meals, and certificates of fitness; (3) special exceptions relaxing the general law in certain factories and workshops, (*a*) as to period of employment, (*b*) as to meal hours, (*c*) as to overtime, and (*d*) as to nightwork; (4) special exception for domestic and certain other factories and workshops; and (5) supplemental matters as to special provisions. Part three relates to administration, penalties, and legal proceedings, and is divided into five sub-sections, namely (1) as to inspection; (2) as to certifying surgeons; (3) miscellaneous; (4) as to fines; and (5) as to legal proceedings. Five schedules complete the Act, the first giving the factories and workshops in which the employment of young persons and children is restricted; the second, the places forbidden for meals; the third, the special exceptions as to period of employment, meal hours, and overtime, the factories in which a child, young person, or woman may be employed for an additional half-hour, overtime for perishable articles, night-work, and the continuous employment of children, young persons, and women, for five hours in certain textile factories during the winter months; the fourth gives a list of factories and workshops divided into two parts, the one relating to non-textile factories, the other to non-textile factories and workshops; the fifth recites the special exceptions, and the sixth the Acts repealed.

SCHOOL-LATRINES.

AT a late meeting of the Society of Public Medicine and Professional Hygiene of Paris, M. E. A. Perrin read an interesting paper and provoked an instructive discussion on the subject of school-latrines. His object was to show the importance of this question with reference to the physical and moral welfare of the scholars. He argued, in effect, that it was of as great moment in respect to health and habits of decency that the child during his school-days should be placed in as favour-

able circumstances in respect to latrines, as he was in respect to other sanitary conditions under which his instruction was pursued ; but that while great attention was given to the state of schoolrooms as to ventilation, number of occupants, lighting, &c., no corresponding care had been given to the state of the latrines attached to the school. It was too commonly overlooked that this latter question, was not a mere passing question of the child's school-days, but that according as habits of decency were inculcated and acquired during the child's school-life, would be the probability of his carrying these habits into his after-life, and so contributing in the most effectual fashion to that gradual elevation of the sanitary status of the population and the kingdom, which the public hygienist aimed at. In the discussion on the paper the necessity was particularly urged that in the arrangement and supervision of school-latrines there should be had in view the correction of those filthy habits and objectionable notions with respect to these resorts which the child has too often contracted from the very general barbarous character of their arrangement in rural districts and not rarely in towns—habits and notions which when he approaches maturity, present the most formidable obstacle to the sanitary amendment of houses and places.

M. Perrin's lesson (although he will probably be astonished to hear it) is as much needed in this country as in France. It is too commonly overlooked with us that the position of much of our present sanitary legislation will depend upon the coming generation rather than upon ourselves, and that the most important element in securing that position is that our children shall start from a higher point of sanitary conception than ourselves. In other words, that our children shall be taught in practice as children, that is to say during their school-days, notions as to the common disposal of filth which the great majority of the present generation have not and could not have in early life. In respect to latrines, it is the very general habit acquired in early life of using the common privy and cesspool, and the indifference acquired by that habit, which forms the great obstacle to the rapid dissemination of correct notions and practice as to filth-disposal. The child who has been brought up to the use of the water-closet, the earth-closet, the pail-closet, or

other form of modified privy, will as a rule acquire an insuperable disgust against those barbarous forms of midden-closet, which are the bane of our rural districts and many of our towns. Now it is during the school-days that this lesson will be best taught, and in proportion as school-latrines are properly arranged and managed we may infer will the much-needed indoctrination of the child's mind with the lesson be secured.

According to M. Perrin, however, we here start from a more advanced point in dealing with this question than our neighbours across the Channel. He was chiefly concerned in urging the necessity of doing away, in French schools, with latrines fitted with stone seats or simple holes in the floor after the Turkish fashion. His object was primarily to urge the adoption of wooden seats after the manner of this country and some other Continental nations in their schools. As a preliminary step to the acquirement of that decency of habit in latrines, which among other things M. Perrin would have secured in French schools, his argument will appear here irrefragable. But what M. Perrin seeks in this respect is the common habit of England, and our difficulties start with the fashion which we retain in common with France of accumulating, and storing, as it were, indeterminate masses of filth in the latrine pits. The efforts of our sanitary administrations in endeavouring to break through this fashion and substitute better fashions for it, constitutes one of the most important features of public hygiene in this country during the last decade. We gather from the discussion at the Society of Public Medicine that, as with us, in respect to schools at least, the water-closet holds the first place in the estimation of French hygienists and next the dry-earth closet; but we question whether the society is familiar with the great amount and variety of work successfully done in other ways in this country to obviate the evils of ill-constructed school-latrines and latrines generally. Notwithstanding much we have done in this matter, very much remains to be done, and we have good reason to know that some of the worst sinners against sound latrine-construction and management are our schools. We do not mean to say that as a rule school-latrines are not kept cleanly and orderly, as far as the closets are concerned; and children are required to maintain, and, as a rule, successfully, habits of decency

in them. But the huge latrine-pit with its great accumulation of putrefying fæces is still very widely retained in connection with schools, and whatever habits of decency may be required of the child as to the closet, he is habituated to the loathsome pit and comes to regard it as the almost necessary, and, it may be said, having regard to the circumstances, the approved accompaniment of the latrine. We still meet men, even among the educated classes, who, from early habit, hold steadfastly to the old-fashioned midden-privy, the common latrine, with all its abominations, as the best sort of arrangement of the kind, and who, as one of them said, "like a good *wholesome* privy-smell." It is, therefore, in view of the persisting influence of early habit that the question of the construction and management of school-latrines deserves the most serious consideration of school-managers and of the Educational Department of the Privy Council. Much no doubt has been done in this country to amend the construction and management of school-latrines, but not all that might be done, especially in rural districts, in view of existing knowledge of what may be effected in this direction.

YELLOW FEVER.

The following letter relative to Yellow Fever has been sent by the Local Government Board to Port Sanitary Authorities:—

LOCAL GOVERNMENT BOARD,

WHITEHALL, S.W.,

17th September, 1878.

SIR,

I am directed by the President of the Local Government Board to state that in view of the epidemic of Yellow Fever which is now prevailing in certain ports of North America—notably New Orleans—it appears to him desirable to draw the attention of Port Sanitary Authorities in England and Wales to the possibility of the importation into this country of cases of this fever.

Such experience as has hitherto been had in Europe of Yellow Fever, which is essentially a tropical disease, has shown that it does not spread except under very special conditions. On the

rare occasions when it has extended from vessels arriving in European ports, its extension has appeared to be almost exclusively among persons on shipboard or employed in the harbour, or living in the immediate vicinity; and persons who have been taken inland, sick of the disease, have not communicated it to others.

The present outbreak, however, appears to be of so malignant a character that no care should be wanting on the part of Port Sanitary Authorities to meet the possible contingency of the introduction into this country of a malady so fatal.

In England, besides other arrangements of the nature of quarantine that are made in respect of this disease, measures of isolation and disinfection of vessels infected with Yellow Fever are adopted by the Commissioners of Customs, under the orders of the Privy Council, as a part of their duties under the Quarantine Acts. Port Sanitary authorities, though not themselves charged under the Quarantine Acts with the duty of securing this isolation and disinfection, can, on occasion, render important assistance to the Commissioners of Customs in executing these functions in respect of Yellow Fever ships.

In the event of any case of Yellow Fever finding its way, notwithstanding the precautionary measures taken by the Customs, into any English port, the action of the Port Sanitary Authority should be the same as in the case of the common infectious diseases of the country, viz.: removal of the patient with all necessary precautions, into a place of isolation, and the destruction or disinfection of any articles of clothing or bedding that may have been used by him.

The Board trust that the Port Sanitary Authority have already provided themselves with means of such isolation and disinfection; but if the Authority have not yet done so, the Board would take the present occasion of again pressing upon them the importance of having such means at all times in readiness.

The Board enclose, for the information of the Port Sanitary Authority, copies of Official Memoranda issued by them on Hospital Accommodation and on Disinfection.

I am, Sir, Your obedient Servant,
JOHN LAMBERT, *Secretary*.

THE PRACTITIONER.

DECEMBER, 1878.

Original Communications.

ON THE VALUE OF SPIRITUS NUCIS JUGLANDIS IN THE TREATMENT OF VOMITING.

BY EDWARD MACKEY, M.D., M.R.C.P., BRIGHTON.

SOME eminent man has been bold enough to say lately that we must "treat symptoms." Practically we often have to do it, and vomiting is a very troublesome symptom. Granted that when we trace it to gastric or hepatic disturbance, calomel and an effervescent with prussic acid are very good; granted that a minim of creosote is valuable, especially when septic changes occur in the food; that iced milk and lime water will relieve acidity, and ipecacuanha irritation; that bismuth, cerium, and many more are known to serve upon occasion. I have yet seen cases where other alteratives have been required, and of these the "spirit of walnut" seems to deserve a more extensive trial. I cannot now ascertain where first I met with notice of it; in current text-books it will not be found at all, but in some old French works it is recommended as an astringent; and recently I have found that Messrs. Corbyn and Co. mention it in their catalogue, saying, "It is highly valued as an antispasmodic and preventive of morning sickness in pregnancy."

In a private note they inform me that they have made the spirit "for at least a hundred years: the demand for it is limited, but those who use it speak very highly of it." They do not mention their formula for its preparation, but Messrs. Southall, of Birmingham, who furnished me with it at the Queen's Hospital, kindly forward me the following:

Fresh walnuts, 30oz.

Spirit of wine (rect.), 12oz. : water, q. s.

Distil, 16oz.

Their preparation is a very good one, light-brown, clear, aromatic, and rather pleasant to the taste; it was stronger, I presume, than that of Messrs. Corbyn, because the dose I used was one teaspoonful (increasing to two), whilst the dose *they* suggest is two tablespoonfuls.

Messrs. Southall further say that it is very little used in their district; and I myself cannot remember meeting with any one who knew it. My own experience is, in general terms, of quick and marked benefit from drachm doses, given every one to four hours, in a little water, for hysterical vomiting, for that of obstinate dyspepsia, and of pregnancy, for anomalous cases, and even for cerebral vomiting. I have tried it in septicæmia, and cannot be surprised if in that case I was disappointed; in the other cases it has always given more or less relief. Its use may be briefly illustrated by the following exceptional cases, the first of which was one of extreme gastric irritability, thought to be possibly connected with capsular mischief (*supra renal*), but it must be classed as anomalous: vomiting was almost the only symptom.

1. Giles T., aged 20, single, metal-roller, came as an out-patient in March, 1875, complaining of constant vomiting after all food and drink; it has lasted four months, ceasing only during an attack of small-pox; afterwards it recurred. Before it began he had always fair health, but several sisters have died of phthisis; the family are poor, yet he seems fairly nourished, though pale, and says he is growing thinner: is not a drunkard. After food there is no pain, but immediately nausea, and soon vomiting. On deep pressure at the epigastrium there is slight tenderness. Blood has never come up, nor passed, and there is

nothing characteristic in the vomit ; appetite good, tongue furred, with red tip and edges ; bowels moderately open. An examination of the abdomen shows an abnormal brownish tint, but this is uniform ; does not know how long it has been there ; it is not P. versicolor ; there is no tumour or accumulation, the circulation and respiration are normal, also the nervous functions. He sleeps well, but there is dull frontal headache, and occasional giddiness ; has aching pains in the legs. The only deviation from a healthy state of urine is the presence of an occasional trace of albumen. Had been under medical care for some time ; was first ordered effervescent, and then creosote and a diet of milk and lime-water, with dry cupping to the epigastrium. Getting no relief, he was taken into the hospital, kept warm in bed, dieted exactly on milk with lime-water, and treated with drop doses of *nux vomica*, with hydrocyanic acid, and with several other remedies I cannot now remember ; also a spinal ice-bag was applied, though not very thoroughly. What relieved him most was a dose of *liq. potassæ* and *liq. opii*, of each five minims ; but opium had evident disadvantages, and for a week he had nutrient enemata only. At this stage, about the middle of April, I first ordered him the *spiritus nucis juglandis*,—one drachm thrice daily. Within twenty-four hours he was relieved, milk was retained, and in a fortnight he left for the Sanatorium.

On June 8, reported that improvement continued ; could eat usual food, and gained weight ; had still occasional sickness. Ordered to take the medicine on alternate days only.

On June 18, having been without medicine for three days, sickness had returned. Rectified spirit alone was now ordered in drachm doses in order to compare results, but it increased his trouble immediately, and was soon omitted and the walnut spirit resumed.

On September 28 reported himself fairly well and at work ; continued his medicine for about a month, and since that time, with care in food, has commonly passed one or two weeks without any vomiting. The brown coloration on abdomen is rather less, and no albumen has been found in the urine. No further light could be thrown on the cause of his malady, and he was not seen again.

2. The next case may be classed, perhaps, as sympathetic or

hysterical vomiting; it was relieved, but not cured. Mary C——, aged twenty-four, nail-worker, was an in-patient in 1874 with menorrhagia and obstinate vomiting. She recovered with rest, diet, and oxide of silver; in a second attack was relieved by milk and lime-water, but now (August, 1875) this has failed to do any good. For several weeks she has had constant vomiting, both between meals and after all food and drink. She has pain until the food is rejected, and is then easier. No blood has been brought up. She has pyrosis and headache, is anæmic, and has acne simplex; bowels regular, menstruation too frequent and profuse, and the vomiting is worst at that time. Ordered in succession effervescent with opium, compound bismuth mixture (with prussic acid and calomba), creosote pill, and cerium powders, without relief.

September 14.—To take spirit of walnut, one drachm, thrice daily.

September 21.—For several days better; occasional vomiting.

September 27.—Much relief continues; some days no attack, on others, one or two only; pulsating headache affecting left face.

October 5.—Better till four days ago, when menses returned and the vomiting also.

October 18.—Vomiting ceased for a time, but has now recurred; complains much of headache. My then colleague, Mr. Clay, kindly examined the girl, but found no indications for mechanical treatment; suggested tincture of cocculus in minim doses, with pulsatilla, which he has found useful in menorrhagia. This was continued for a month, when she seemed rather better, but had never passed many days without vomiting and headache. Menses twice last month, once this; much pyrosis. To take bismuth and oxide of silver.

November 30.—Menses recurred, and the vomiting, severely.

In December, spirit of walnut was resumed, and in January the note is, that it gave more relief than any other remedy. The case passed then from my observation.

3. I will refer only to one more example, and that is of cerebral vomiting. I have not detailed notes, but the case was one of basilar meningitis—a diagnosis fully assented to by the two practitioners in attendance before me. The only point I have

to record specially is as to the *vomiting* being relieved, without pretending that any vast good was effected.

A lady of about 30, pregnant three months with her third child, got persistent and severe frontal headache, and soon afterwards vomiting; this occurred suddenly, irregularly, and without much nausea, but was very distressing and prevented administration of nourishment or medicine. It had lasted several days without relief from ice, diet, &c., when I suggested spirit of walnut, and this distinctly and at once relieved the vomiting. I scarcely think this was wholly stayed, but it certainly was so sufficiently for nourishment, &c. A fair trial was given to calomel, to aconite, to iodides, but the general symptoms, with occasional delusive improvements, progressed too surely to a fatal issue, with strabismus, dysphagia, clouded intellect, convulsion, and coma.

In simpler cases I will only say that my results have been more satisfactory and more permanent, and I will venture to recommend the *spiritus nucis juglandis* to a wider circle for a more extensive trial.

ON PAPER LINT.

BY JOHN CHIENE, F.R.C.S.,
Surgeon, Edinburgh Royal Infirmary.

DURING the last three months paper lint has been tried in the wards under my charge in the Edinburgh Infirmary. The first notice of its use with which I am acquainted is to be found in the *Philadelphia Medical Times*, March 30, 1878. In this paper by Dr. Keen, one of the surgeons to St. Mary's Hospital in Philadelphia, the paper lint is recommended, first on account of great absorbent powers, second on account of its cheapness. The objection to its use is that it tears too easily. Dr. Keen hopes to remedy this by introducing into its substance threads of cotton. The form in which it has been used by me is as boracic paper lint.

Common lint which has been soaked in a boiling saturated solution of boracic acid is hung up to dry; after drying, the water passing off, the lint is loaded with boracic crystals. The lint so prepared is antiseptic, and is the form of antiseptic recommended by Mr. Lister in the treatment of ulcers.

If boracic paper lint can be easily prepared, and if it is equally efficacious, a great saving will be effected. The boracic paper lint is prepared in the laboratory of the Edinburgh Infirmary in the same way as the boracic common lint. At first difficulty was experienced, but these difficulties have been overcome by Mr. Barclay, M.B., C.M., and a very serviceable lint is now made. The paper lint takes up its weight of boracic crystals. If it comes into general use it might possibly be impregnated with the boracic acid during its manufacture; boracic acid being non-volatile, the paper pulp could be made with a saturated solution of boracic acid, and the paper then passed over the drying frames.

Paper lint can be used for almost every purpose that common lint is used. I have made use of it principally in the treatment of ulcers, as recommended by Mr. Lister. The ulcer is

thoroughly rubbed with chloride of zinc solution (forty grs. to the ounce), the surrounding skin purified with one to twenty carbolic lotion, a piece of protective the size of the ulcer is then placed on the sore, and then a single or double layer (depending on the amount of the discharge) of boracic paper lint is laid over the protective, overlapping it in every direction. The lint is soaked in the lotion before application. The discharge passes out below the protective into the paper lint. After the first dressing (if this is sufficient to purify the sore), boracic lotion is used as being sufficiently powerful and less irritating than carbolic lotion. In very putrid ulcers it may be necessary to apply the chloride of zinc lotion twice before purification is complete. The frequency of the after dressings will depend on the amount of the discharge. As far as I am able to judge, paper lint will supersede common lint, not in consequence of its superiority, but in consequence of its cheapness.

We have now a cheap paper dressing which can be impregnated with a non-volatile antiseptic, like boracic acid, *without interfering with the porosity* of the dressing. We have yet to get a paper dressing which will retain a volatile antiseptic like carbolic acid (giving it off at the temperature of the body) and which will still be porous. Dr. Keen speaks of this as a simple matter, but my experience is that it is a matter of some difficulty. In the gauze the carbolic acid is retained by resin; this material renders the paper at once non-porous, and therefore useless in soaking up the discharges. Two years ago paper suggested itself to the writer as a material which might replace the gauze if it could be loaded with carbolic acid and still retain its porosity, the carbolic acid being retained in the paper by some material analogous to the resin in the gauze. Many experiments were made but no material which could compare with the gauze as a dressing could be obtained. Gelatine retains carbolic acid; it is at the same time soluble in water, and some preparation of paper might be obtained loaded with gelatine and carbolic acid. The American chemists have supplied us with the paper dressing, perhaps they may assist us still further by loading the paper during its manufacture with boracic acid, and by discovering a method of retaining volatile antiseptics in paper without interfering with the porosity of the material.

ON THE PREVENTIVE TREATMENT OF CLEFT PALATE
AND HARE-LIP, AND SOME FURTHER REMARKS
ON THE RELATION OF THE OVARIES TO THE
SEX OF THE CHILD.

BY THOMAS P. TUCKEY, M.B., T.C.D.,

Castletownroche, County Cork, Ireland.

MY attention was directed, some years ago, to the remarkable success which has attended the Dublin Zoological Society in the breeding of lions, and the great immunity which animals born in their gardens in the Phoenix Park, enjoy from various disorders and deformities to which the lion bred in a state of subjection is liable. The most remarkable of these diseases is cleft palate, which, I believe, lions born in a captive state are very apt to have. It was the Rev. Professor Haughton, I believe, when speaking before some public assembly, who drew attention to this fact, and stated that it was his opinion that the cause of the lions in the Dublin Gardens being born so unblemished was giving the mothers bones which they could crush. I indeed saw the same stated in this week's issue of the *Medical Press and Circular*. At the time I first saw the fact stated, I was much struck by it, and as I happened to have under my observation a family of several children who were all, both male and female, the subjects of hare-lips, several of which cases were complicated with cleft palate, I determined to speak to the mother, who was in poor circumstances, and ask her to let me know the next time she was in the family-way, and that I might give her a medicine which would prevent her next child having the same deformity as the others. The poor woman was heart-broken, taking her children here and there to be operated upon,

and quite jumped at the idea, and promised faithfully to come and report herself the moment she believed herself to be *enceinte*. I then took down her family history, which ran much as follows:—

Mrs. H., aged 35, mother of six children. Every one of her children have had hare-lips, two have also had cleft palate. The disease appeared not to be hereditary, and she could not call to mind any of her family or of her husband's family who have had hare-lips. Is a fine strong woman, but has fearful crooked eyes, no other deformity. Has always had good health. Her husband small, but strong and healthy; never has had any diseases while she has been married to him. He and she have both lived all their lives in the country. He is sober, and has always been so. Her first child had simple hare-lips, no cleft in palate, does not remember getting any frights when carrying her children. Her last child two years old.

In a short time this woman came back to me stating that she had missed a menstrual period, and believed herself to be pregnant. I immediately put her on the following mixture:—

R̄ Calcis Phos. ʒj. grs. 20,
 Calcis Carb. ʒj,
 Bicarb. Magnes.,
 Chlorid. Sodii,
 Sodæ Phosph., āā ʒss. M.

To be added to an 8 oz. mixture composed of gelatine, gum arabic, syrup of ginger, and cinnamon water; ʒj. three times daily.

Clefts in the lip and palate are due to arrest of development prior to the end of the third month, and therefore I was most anxious that she should commence the treatment at once. I therefore made up the above mixture, which I am afraid physiologists will smile at as representing a very rough analysis indeed of the constituents of bone. However, it was the nearest I could make, and I think its utility was shown by the result. Were I fortunate enough to meet with other cases besides the ones I am recording, I think I would grind up the bones of the head of some animal and give some of the powder instead. The remedy would be thus more physiologically correct, and would save a great deal

of trouble, for the above mixture is most intractable to mix, and I am afraid undergoes some chemical decomposition into the bargain. The woman took the mixture regularly until the fourth month of pregnancy, when it was discontinued, and she went to her full time and was delivered of a girl, without a trace of deformity about her lips or palate; the child was healthy and strong.

The next case is more remarkable still, and gives a most convincing proof of the utility of the phosphates in cases of the kind.

Hearing of the former case, a woman, Mrs. L., came to me to ask my advice. She was the mother of eight children, most of whom had cleft palate and hare-lips; in four of them the hare lip was double, and more shocking objects of the deformity I never saw. One boy was perfectly repulsive, for the central portion (as in a case reported by Mr. Butcher in the *Dublin Journal of Medical Science*) had been cut away, and the attempt to unite the lips having failed, a large open gap was left, which gave the boy the appearance of a dog about to spring on his prey. The woman stated she believed herself pregnant, and I immediately put her on the mixture. She went her full time without any mishap, and was delivered of a girl, without a hare-lip, indeed, *but who evidently had had one in utero*, for the lip, though united, was united *crookedly*, and one side was puckered up as if by a slight and narrow burn. I can only find the record of two cases of the like description recorded before, viz., by Wagner (*Verhandlungen der Gesellschaft für Geburtshülfe in Berlin*). In one "union had taken place with a distinct red cicatrix, and that deep indentation of the free margin which it is our object to avoid in operative proceedings." (Copeland's *Surgical Dictionary*, 18th Edition, Art. Hare-lips.)

All intra-uterine deformities may be classed, I conceive, under the following heads:—

Redundancy of parts.

Deficiency of parts.

Non-union of parts.

Preternatural union of parts.

Intra-uterine amputation.

Reversion of type.

Hare-lip is either hereditary or accidental. In either case the deformity may be classed under the head of Reversion of Type. In the cases of the hereditary deformity, there is something in the father's or mother's constitution which perpetuates in all their offspring the retrograde type. In the cases, on the other hand, which are accidental, some children are born with the deformity, others are exempt. I think there is nothing irrational in such a supposition. In my young days I lived with an aunt who was a great florist, and among other floricultural passions, had a great love for dahlias, of which flower she cultivated a great number. Now I noticed in plants which did not receive as much manure as others, that they brought forth flowers which were single, *i.e.* insufficiency of food was followed by a reversion of type. I have since made experiments with other plants, and find that a double geranium can be easily so starved as to produce partly single flowers, the first step being that the stem of the petal shoots up into a green stalk, and produces the appearance of one flower growing on top of the other; the next step is that the flower is single. On the other hand, if a flowering plant be over-cultivated, it will produce nothing but leaves. So also the human female will often, if heavy and over-fed, be barren. In fact, it requires a proper balance of food to produce a healthy plant, a healthy animal, and a healthy man. And it can be thus explained how in some females some constitutional deficiency, which cannot be overcome, causes them to bring forth children all afflicted with the same deformity, while in others the proper balance is only disturbed for a short time, to be set right before the next pregnancy. I hope *alma mater* will not shake her head at my professing Darwinism. I do not profess Darwinism, though I do believe in reversion of type. On the contrary, I believe in these occasional reversions in man to appearances seen in the lower animals, as a still further proof of a single Great Creator. As in the paintings of a great master of his art, no matter how different, a practised eye can trace touches and peculiarities which stamp the works as emanating from the same hand, and as one sees in several machines invented by the same engineer, to suit several ends and different in form and size, the same mode of utilising the motive power. So I can trace the same

leading idea running through nature endlessly diversified, but showing clearly by its return to a lower grade that it was the same hand which made, and the same Infinite Wisdom which imagined the lowly insect and the lordly man. This discussion on the reversion of type brings me to the second part of my heading, and in this way. Sir James Simpson, in his writings on hermaphroditism, states that in those cases of that form of a reversion of type, which he calls true lateral hermaphroditism, there is a testicle on the right side usually, and on the left an ovary, or, in other words, when man reverts to the state of some of the lower animals, for instance in one of the nudibranchiata, its right half is generally male, and its left female.

In the *Medical Press and Circular* for the 13th March, 1878, I drew attention to the position of the placenta, as giving us a hint beforehand of the sex of the child, and I gave a table of fifteen cases where I had introduced my hands into the woman's uterus and removed the placenta. Of these fifteen I proved that *in every case* the placenta was placed to the left of the median line where the child was a female, and on the right where it was of the male sex. Now I do not mean to argue anything from the fact that in true lateral hermaphroditism the halves of sex are generally right and left, male and female. It was merely the association of ideas which led me to speak of the two in relation to each other, and though we cannot deduce any argument from the similarity, yet I think the fact is worth mentioning. I do not yet know whether my idea, that the right ovary is intended for the production of males and the left for that of females has been thought worthy of proof or the reverse; but I know, to my mind and experience, the arguments that such is the case are growing stronger every day. I have met several other cases since which tend to corroborate my statement, notably one where I diagnosed the sex of the child in the presence of another medical gentleman, who called me in to consult with him before it was born, to his great wonder, which diagnosis had a very decided influence on our management of the case.

It is not fair, however, to ride one's hobby and boast that he never stumbled when one is conscious that he has now and then given a trip.

In all the cases in which I have been enabled conscientiously

to put my hand into the uterus—for I contend that no seeking after knowledge ought to tempt a medical man to do what might, even very remotely, injure his patient—of all the cases then which I have been able to bring to bear on the truth or opposite of my assertion, only one has shaken my belief in its truth. In the case of a woman who had a male infant, I think the placenta was low down on the left side. I cannot be very sure that this was the fact, as the case was one of partial placenta prævia. Happily for herself the woman was very quickly delivered, and the placenta immediately followed, indeed, was born with the child, but as far as I could judge, the placenta was on the left side. Granting the matter, however, incontestably proved, it does not militate much against my original assertion, for it would be unphilosophical to argue that because one occurrence of the placenta being attached to the left side in the case of a male infant was noted, my idea was, therefore, incorrect. “But, sir,” some one says, eager to disprove my assertion, “one such case upsets a whole theory in a matter of this kind.” “Not so, sir,” I reply, “no more than the fact of a foetus being found in a woman’s Fallopian tube would disprove the well-known fact that its proper place is the uterus, or that because the placenta is sometimes placed over the cervix, that therefore its proper position is not the fundus.” Believing, as I do, that there is a close relation between the position of the placenta and the sex of the child, and consequently between the sex of the child and the ovaries, I am very anxious to get further proofs of the matter. I have not been able to gather any cases where either ovary has been extirpated, and where the woman has afterwards married and borne children. It would be extremely interesting if conclusive proofs or disproofs of such cases could be collected, which I daresay could easily be done, if any of our great ovariologists could be got to turn their attention to the matter.

OBSERVATIONS ON DIGESTION IN A CASE OF ARTIFICIAL ANUS.

BY J. SINCLAIR HOLDEN, M.D., SUDBURY.

IN umbilical hernia strangulation and sloughing of a large loop of intestines sometimes takes place without being followed by a fatal result. This occasional exemption, which seldom happens in the femoral or inguinal varieties, seems to be due to the facility with which the abdominal wall in the umbilical region yields to the uniform pressure of the strangulated mass, which literally sloughs its way through; the dead tissues soon separate and an artificial anus is established.

The following case is illustrative and exhibits many points of interest.

Mrs. D., a lady aged 37, with seven children, for some years, in spite of leading an active life, got rather stout and corpulent. Shortly after her first confinement she noticed for the first time a small protrusion at the navel, which, becoming painful and larger, necessitated her wearing a truss; at no time was it larger than a walnut, and it was always easily reduced by herself.

In December, 1873, she, being five months pregnant, noticed a marked increase in size of rupture and difficulty in returning it, so that she gave up trying and left it alone. About a fortnight after she was one day seized with violent pain at the navel, followed by vomiting. Being sent for I found on examination an œdematous protrusion at navel, with an erysipelatous blush extending three inches below, and on deep pressure discovered a well-defined hard tumour, quite free of the uterus, movable, attached to the umbilicus, and as large as a cocoa-nut. The bowels had not been moved for four days, though she had taken castor oil. I ordered copious enemata, which gave no relief, I also failed, with the aid of chloroform, to reduce the rupture. On the following day I had a consultation with two medical friends, and, as all the symptoms looked graver and pointed to strangu-

lation, an operation was decided upon in order to relieve the constriction. Cutting down to the sac and upwards through a portion of linea alba I divided the constriction, but not being able to release the sac, I opened it and found it to contain omentum, which was continuous with the hard tumour below, and could only be slightly pushed back; no intestine was detected. The operation relieved the urgency of the symptoms and we had hopes that the bowel was only so far implicated as to be inflamed and paralysed by pressure of the tumour. During the few days' pause I had the benefit of the opinion of Dr. Millar Ord of St. Thomas's Hospital, who saw the case; he considered the tumour to be a matted and enlarged condition of the omentum, and that by continuing the plan of subduing inflammation of the bowels we might get them to act. For this purpose atropine was given for some days. The only ominous sign of mischief was the erysipelatous state of the lower part of the surface of the tumour.

Five days after the operation vomiting set in again, with tympanitis. The tumour was gradually bulging just below the umbilicus and shortly the skin gave way; sloughs formed which brought forward and exposed a loop of gangrenous intestine; this I opened and gave exit to a large quantity of offensive fecal matter. Considerable sloughing ensued, which involved the seat of the operation, portion of the omentum tumour, and four inches of the ileum. In a few weeks the parts had healed and contracted around an india rubber tube temporarily placed there, thus producing an umbilical anus, which I believe opened into the middle of the ileum, rendering useless for digestive purposes fully one-half of the intestines.

I had some trouble in adapting a permanent tube that could be worn comfortably, but succeeded in devising one which she wore for three years; it was made of ebonite, the aperture half-an-inch across, the inner end with a collar round it, which prevented the tube slipping out, and what was of greatest importance presented a smooth broad ring to the contraction of bowel with freedom from pain. It had to be introduced under chloroform. A plug in the tube she could never endure, but wore an indiarubber bag into which the tube fitted. There was a shield placed three inches from the inner and one from the outer end of the tube.

As soon as she had commenced the use of tubes a new difficulty arose ; from her being six months pregnant, the movements and growth of foetus kept forcing the tubes out. I was therefore obliged to bring on premature labour and deliver. She got through this complication satisfactorily.

The matter discharged through the tube was never foecal either in colour or odour, and varied with her food. Warm drinks, such as tea and soups, always started a thin watery and painful discharge, containing part of the drink. Oils, fats, starchy food, as rice or arrowroot, also the white of boiled eggs, passed in part unchanged and could be easily detected in the discharge. Meat of all kinds and salmon made the discharge so thick that the consequent pain and difficulty compelled her to abstain from them. Bread and butter, gruel, milk, and brandy, raw eggs and oysters, white fish, suited her best ; with these the discharge was viscid and painless.

Thus the food which was mainly digested in the stomach alone, or in the intestines alone, disagreed much more than that kind of mixed food which is digested in both.

The presence of the umbilical anus seemed so far to disturb digestion that there was often a precipitancy in the passage of the chyme. This was always more marked when farinaceous or fatty food formed the principal part of the diet. The opening seemed to determine their onward passage too rapidly to allow of complete digestion.

Beef-tea never agreed, always passed rapidly, and excited a painful watery discharge from the tube.

After taking food which agreed there was always in about an hour a discharge containing some parts of the food and biliary secretions ; a hot drink or a seidlitz powder would act in ten minutes, rapidly washing out stomach and intestine. After breakfast there was always a large flow of bile, generally following at an interval the usual food discharge. Until this dark bile passed, often to the extent of half-a pint, she could not leave her room. Her physical condition at this time was really surprising. She kept well-nourished, was able to get into society at home, walk about, play croquet, &c.

Every few weeks she had the feeling as if the lower bowel wanted to be relieved ; enemata at this time always brought away

several large scybala, clayey and very light in colour, but without smell—evidence of some excretion still going on in the unused intestine.

The skin for some inches surrounding the tube gave her sometimes trouble from excoriations produced by the discharge escaping by the sides of the tube when she was asleep. The best application I found to be an equal admixture of collodion and castor-oil; this, and frequently syringing with disinfectants, kept the parts in as satisfactory a state as could be possible.

The termination of the case took place three years and seven months after the operation, and was mainly owing to the difficulty in keeping patent the orifice at inner end of tube. About a year before her death a hard knob connected with a part of the omentum tumour pressed forward and was always blocking the passage into the tube, so that the discharges accumulated behind and gave rise to painful distension. For a time this nodular projection could be pushed aside, but about six months before her death it gave rise to such constitutional disturbance that its removal was absolutely necessary. Professor Humphry, of Cambridge, at this time saw my patient with me, and as the knob was just within reach of the finger we removed it with the *ecraseur*. This gave only temporary relief as the projection grew, quickly spreading more round the orifice. I removed portions several times but could never clear the passage. Her sufferings at this time were very great, and jaundice setting in she gradually sank and died.

After her death I examined the condition of the parts beyond the tube and found there a ring of dense cartilaginous tissue implicating the peritoneum, intestine, and omentum. The upper portion which formed the chief obstruction was three inches thick. This growth was likely excited by the constant friction of the distal end of tube and made worse by the increased peristaltic action of the bowel trying to overcome the obstruction; frequently the tube was expelled by this pressure, but without any relief to the blocking in the passage.

This case would have been interesting to have had in an hospital, where physiological investigations were pursued, as many further experiments might have been made on the digestion of the various kinds of food.

HEALTH RESORTS IN AUSTRALASIA, SOUTH AFRICA, AND SOUTH AMERICA, OR MEDICAL CLIMATO- LOGY OF THE SOUTHERN HEMISPHERE.

BY C. FABER, M.D. OF STUTTGART.

(Continued from p. 361.)

IV. TEMPERATURE IN THE INTERIOR OF AUSTRALIA.

It has already been pointed out how it is that the climate of the interior of Australia deserves particular attention, not only from a general meteorological, but also from a climato-therapeutical point of view. It is principally with regard to the latter that I shall go into the climatic details of a number of inland places, so that any physician reading this may be enabled to judge for himself on their climate, and whether it will be advisable in a certain case to send his patient to that climate, than which there is none more powerfully stimulant.

Penetrating into the interior from south to north, in which direction it is most easily reached, there are first several stations on the river Murray, which latter forms the frontier between Victoria and New South Wales, or those vast sheep plains teeming with sheep and cattle, called the Riverina. Where that river enters the plain, coming down from the Australian Alps, lies *Albury*, in latitude S. 36°, and 572 feet above sea-level. From Melbourne it is easily reached by rail. The neighbourhood of the highest mountains of the continent gives the advantage of retiring there easily in summer when at Albury the mean maximum temperature of the hottest month (January) is 94°, and to return when the temperature is more pleasant. The mean minimum of the coldest month at Albury is 33°.4. The

mean daily range is a high one, viz. 30° . Lower down the Murray, on its southern or Victorian border, lies *Echuca*, which is also connected with Melbourne by a railway. The distance is 156 miles, the height of that place above sea-level 280 feet. It is considered a hot place; but though I was there in mid-summer, and that a very hot one, I did not find the heat in any way distressing. 90° at Echuca is not at all the same as 90° at Greenwich. Altogether I got a rather favourable impression of the former place and its surroundings, and I think that an invalid might fare well there. Its mean temperature is, according to Dr. Neumayer, $62^{\circ}6$ —in summer 76° , in winter $50^{\circ}5$ —a difference of about 25° , or nearly 10° more than at Melbourne or Greenwich.

Following the course of the Murray, *Swanhill* comes next, 231 miles distant from Melbourne. Though about three-quarters of a degree nearer the equator than Echuca, its mean temperature is, if one can judge from a two years' average (Dr. Neumayer), about half a degree F. lower. The continental character of its climate is more marked, summer being somewhat hotter—mean $77^{\circ}7$, winter cooler, 46° , than at Echuca.

The westernmost station on the Murray where this largest Australian river is joined by its largest, yet not perennial tributary, the Darling, is *Wentworth*, in latitude $35^{\circ}8$, only 150 feet above sea-level. It is a remarkably hot place, with a mean of $64^{\circ}4$. The mean maximum of the hottest month, however, is not higher than at Albury, viz. 94° ; whilst the mean minimum of the coldest month is over 7° higher. The mean daily range is 23° , i.e. 7° lower than at Albury; so that its climate appears to be comparatively warm, and at the same time equable.

North of Echuca, in the boundless plain of the Riverina, lies the principal town of that district, *Deniliquin*, in latitude $35^{\circ}32'$, 410 feet above the sea-level. A meteorological station has been there for more than a decennium. Its mean temperature is 60° . Summer is a trifle hotter than at Wentworth, winter cooler; mean minimum of coldest month, $53^{\circ}3$. The mean daily range is considerably greater, viz., $30^{\circ}6$. It is greatest in March, smallest in June.

Urana, which lies to the east of Deniliquin, in nearly the same latitude, is hotter—mean 62° —but more equable.

Wagga Wagga, situate on the Murrumbidgee, in the great plain, still near the hills, has comparatively cool summers, whilst winter is not colder than at Deniliquin. The daily range is much less, not quite 20° .

A long way to the north, in latitude $32^{\circ} 18'$, where the river Macquarie enters the plain, lies *Dubbo*. Although 3° nearer the equator, its mean, $60^{\circ} 6'$, is probably, in consequence of the neighbourhood of the mountains, scarcely higher than that of the last-named place. Its summer is hotter, but winter, if we go by the mean minimum— $35^{\circ} 3'$ and $35^{\circ} 8'$ respectively—about the same; the daily range is greater— 25° at Dubbo.

Following from this station a north-westerly direction, which leads right into the interior of the continent, the next one is *Cowga*, on the Bogan river, near Mount Hopeless, an extremely dry neighbourhood, where no rain was observed to fall for thirty-seven months together. Cowga is about 350 feet above sea-level, in latitude $31^{\circ} 10'$, 290 miles distant from the east coast. It is, as far as present observations go, the hottest station in all New South Wales—hotter even than Brisbane, the capital of Queensland, which is about 4° nearer the equator. Its mean is 71° ; the mean maximum of the hottest month over 100° ; the mean minimum of the coldest month $44^{\circ} 7'$. The mean daily range is also the highest of all stations, viz., $31^{\circ} 7'$. The period of observation was four years.

Fort Bourke lies in latitude 30° , 393 miles from the sea, and 216° above it, on the river Darling. Mean annual temperature, $67^{\circ} 5'$ (?); mean maximum of hottest month 92° ; mean minimum of coldest month, 41° ; mean daily range, 21° .

For *Thargominda*, the farthest inland meteorological station in Australia, the respective figures are: $70^{\circ} 6'$, $98^{\circ} 5'$, 41° , 21° . This place lies in latitude 28° , to the north-east of Grey Range, east of the lake district, into which the grand system of the Bascoe, said to be the greatest in the world, empties itself when it is not empty.

This brings us into the very centre of the Australian continent, which, though most imperfectly known as it is, from all appearances seems to be one great desert, either periodically in the hot season only when all the water-courses are dried up, or permanently.

“Our experience of the climate in the interior is, of course,

very limited," remarks the Government astronomer of South Australia, to whose territory Central Australia belongs, and who being at the same time superintendent of telegraphs, and consequently also of the great overland telegraph line, must be considered to be qualified to speak on the subject. Before that telegraph line was constructed—under what difficulties!—our only knowledge came through brave explorers, who more or less successfully faced those obstacles with which Australian exploration is beset—the principal ones of which are want of water and fresh supplies of food for man and beast, excessive heat and the impenetrable scrub, mostly composed of the horrid spinifex, *Festuca irritans*. Sturt has given a graphic description of the climate in the desert and its effects on animate and inanimate creatures. Here we are only concerned with his observations on temperature. I have, however, to premise that the figures given by him appear to me far too high, so that it must be doubted whether they represent real shade-temperatures. This doubt is the better founded as by the observations above given of the meteorological station at Thargominda, we can pretty well control his figures, that place being near the Grey Range, where Sturt was for six months detained by the heat, and consequently for want of water. Here between latitude 29° and 30° he found the mean of the three summer months, December 1844, January and February 1845, to be 101° , 104° , and 101° F. respectively! Now at Thargominda the mean *maximum* of the *hottest* month is only $98^{\circ}5$. Several times according to Sturt the temperature, in the shade, was as high as 130° , and 157° in the sun. At Thargominda in 1874 the highest temperature in the shade was observed to be 109° . Sturt says he has observed changes of temperature sometimes of 79° to 80° (?).

Soon the telegraph followed the explorers from coast to coast, right through the centre of Australia, and it probably will not take very long before the steam-engine in its turn follows the telegraph. Such is the energetic, ever pushing forward character of the Australian colonists. Fancy an old-world community of something over 200,000 inhabitants, as the vast territory of South Australia in 1875 had, doing so much work as this community has done and is doing: sending out numerous exploration parties, some of them on a large scale, thereby opening up the

interior, and enlarging not only her pasture ground, but also geographical science; annexing a large tropical country, the northern territory, connecting it with the far off northern colony by a telegraph line about a thousand miles long, right through the worst of deserts, besides rearing innumerable flocks of cattle and sheep, cultivating nearly a million and a half of acres of ground mostly devoted to wheat, working rich mines and doing an ever-increasing shipping trade, the balance of which was in 1875 by 600,000*l.* in favour of the export. And this thriving colony is about forty years old. This is only one instance of the activity and prosperity of the Australian colonies.

To return to the overland telegraph, it is the stations along it that have become the means of knowing something, fragmentary though it be as yet, of the climate in the regions it traverses. Those stations are at the present only supplied with rain-gauges, so that officially the rainfall, that *nervus resum* of Australia's prosperity, is only recorded. But occasionally the observations there have been more extended, as by Mr. Giles, who for several years had charge of the *Charlotte Waters Telegraph Station* in lat. 25° 9'. There the highest known temperature in the shade has been registered at 110°; the highest at 9 a.m. at 94°; the lowest (at the same hour) was 47°. With a hot wind, the temperature was observed to stand at 103° at midnight. Pleasant night that must have been! The changes of temperature were *not very sudden*, "doubtless," Mr. Giles adds, "owing to the distance inland, and partly to the large tracts of sterile and stony country which is slow to part with its heat;" just the very reasons why we would expect the climate to be most excessive. How it is that this is not the case will be explained later on.

Colonel Warburton has, in 1873, for a short period taken observations near *Alice Springs Station*, on the north side of MacDonnell Ranges, which, situate under the tropic of Capricorn, and running, as far as they are known, nearly parallel with it, may be called the dividing range of Central Australia. They go ^{up}over 4,000 feet above sea-level, and consist of bold granite ranges, rising abruptly above the plains, which probably are already over 2,000 feet above the sea.

The mean temperatures, as observed there by Colonel Warburton were—

	In January.	February.	March.
At sunrise. . . .	67°	77°·5	68°·7
„ noon	97°·4	98°·4	95°·1
„ sunset	89°·3	88°·4	86°·3

The highest temperature observed was 110°. At the south coast (Adelaide) we have noticed over 113°.

Last we come summarily to compare the temperatures in the Australian stations mentioned among one another and with those in some other places, Greenwich in particular.

There is only one station, and that the one highest above sea-level, in all Australia where the mean temperature is lower—45°—than at Greenwich—49°·4. It is Kiandra, 4,640 feet above the sea. From that up to a temperature of 71° at Cowga—tropical Australia is here left out of consideration, as not being to our present climato-therapeutical purpose—all gradations of temperature may be found.

Of special interest from the point of view just indicated are the *fluctuations of temperature*, on which the equability or non-equability of a climate mainly depends. If we, in this respect, compare the climate of even the remotest inland stations in Australia with that of inland places of other continents, Asia for instance, in about the corresponding latitudes, we find that the former is a great deal more equable than the latter.

At Leukosan, on the west coast of the Caspian sea, several feet *below* ocean-level, in lat. N. 38° 44', the difference between the mean summer—77°—and mean winter—40°—temperatures, is 37°; at Mosul, on the Tigris, in lat. N. 36° 19', it is 44° (90° against 46° respectively) whilst at Echuca, on the Murray, in about the same latitude, it is not quite 26°. In Central Asia the climate is known to be still much more excessive. At Cairo, which is near two seas, but also between two deserts, that difference between the mean temperatures of summer and winter is 28° (83°·5 against 55°·4 respectively). In the interior of Australia the highest difference I have down in my notes is 31°·5 (77°·7 against 46°·2) at Swanhill. Of all the stations I have had the necessary data from for computing the mean temperatures of

the four quarters, the *difference between summer and winter* is lowest at some Victorian coast stations, *i.e.* 10° at Cape Otway, 11° at Portland, 16° at Melbourne. At the West Australian places, Perth and Freemantle, it is $15^{\circ}5$ and 14° respectively. Next come Sydney and Brisbane, with about 17° , then Adelaide with 20° . The latter place has the most excessive climate of all the Australian coast stations. Yet the figure given just now of it is by 2° below that for Greenwich, where the difference in mean temperature between summer and winter amounts to 22° (61° against 39° respectively). In the mountains that difference has pretty much the same range as in the interior.

That the climate in the interior of Australia is not very excessive as compared with that in the two other climatic zones, *viz.*, the coast and the mountain zone, will also be shown by the following considerations :—

The difference between the mean maximum temperature of the hottest month and the mean minimum of the coldest one ranges at the New South Wales coast stations, between 33° (Port Macquarie, Eden), and 50° (Bodalla); in the coast-district stations between 45° (West Maitland) and 56° . The latter is observed at Casino, the one station nearest the equator, and only thirty miles distant from and 139 feet above the sea. The rule is that the climate of a place is *ceteris paribus*, the more equable the nearer the equator the latter is. At Greenwich that difference is 40° .

In the mountain zone of New South Wales that range is from 49° (Lake St. George) to 60° . The latter difference does not, however, obtain at the highest station above sea-level, Kiandra, but at Bathurst, which is situate some 2,400 feet lower, but on the east side of the Dividing Range. At the inland stations that difference between the mean minimum and maximum is from 51° (Bourke) to 63° (Wentworth). Still the mean daily minimum of the coldest month is at the last named place higher than that of April at Greenwich (39° and 41° respectively).

At Adelaide that range is 42° , or only 2° higher than at Greenwich. The mean minimum temperature of the coldest month is at Adelaide, the same as that of May at Greenwich. Winter, therefore, is in Australia as a rule a very pleasant season. It will, however, be in another place that I shall try to

give a more lively picture of the Australian seasons than can be furnished here. In this chapter it was my purpose that dry figures should speak for themselves as much as possible.

There are two more series of ranges of temperature to be considered, the daily and the annual one. These also to a certain extent bear out the fact that the climate of Australia, as far as temperature goes, is not an unequable one, and in special, that the climate of the interior, that land of promise to the invalid, does not, if compared with that of the coasts, show nearly such extremes as we find them in the interior of other continents, especially in Asia. Contrary to what we know of the latter continent, it also always has to be kept in mind, a fact most important from a climato-therapeutical point of view—that all those changes of temperature we are speaking of almost always and everywhere in Australia are on a warm level, *i.e.* more or less above freezing-point.

Although the Australian climate is a dry one, yet the *mean daily range of temperature* is on the New South Wales coast only about the same as at Greenwich, 16° or even less, going from 13° to 18° . This again shows the remarkably equable climate of that part of the Australian coast. On the same east coast, however, but nearer the equator, at Brisbane, in latitude S. $27^{\circ} 28'$, the mean daily range is as high as $21^{\circ} 4$. At Melbourne, on the south coast, it is nearly 19° ; at Adelaide $20^{\circ} 6$, and about the same on the west coast, at Perth.

To return to New South Wales, our climatological standard, by its excellent meteorological organization and publications, as well as by its marked division into the three climatic zones, the mean daily range of temperature in the coast-district stations is already considerably higher than on the coast, *viz.*, from $21^{\circ} 5$ (Maitland) to $28^{\circ} 6$ at Casino, again the one station nearest the equator. The latter circumstance is explained by the curve in which the sun rises above the horizon being higher, and the daily range of temperature accordingly greater in a place nearer the equator.

In the mountains it is from 17° at Orange near Bathurst, and, therefore, on the inland side of the Dividing Range, some 700 feet higher than that place, to over 30° at Bathurst itself! Probably it is the situation of the latter place on a treeless

plateau that accounts for the great fluctuations of temperature there.

In the interior the daily range of temperature is from about 20° to nearly 32° (Cowga). It is a remarkable fact that whilst as a rule the mean daily range is greatest in summer, smallest in winter, the reverse obtains at Brisbane and Sydney. Perhaps it is to part of the wet season, with its equalizing influence on fluctuations of temperature, falling in with the summer months that we have to look for an explanation of that exception from the rule.

The other series of ranges of temperature referred to above are the *extreme annual* ones.

At Greenwich the highest temperature in the shade observed within thirty-five years up to 1875, was $96^{\circ}6$, the lowest 4° . Extreme range, therefore, $92^{\circ}6$. In the meteorological table I have prepared for private use, of all the Australian stations I could get hold of the highest temperature observed anywhere is 118° , at Deniliquin in the Riverina; the lowest is 21° , at Bathurst and Goulburn, two mountain-places. At Kiandra it must be still considerably lower, as also occasionally at the other mountain places. Of the coast places, Adelaide presents the highest maximum, viz., $113^{\circ}5$, Melbourne and Portland have the lowest minimum, viz. 27° .

The greatest yearly range in 1874 at any one place that I have down in my notes, was at Albury, from 114° to 22° , and at Deniliquin, 118° and 25° respectively. The former is the same as that given above for Greenwich. As we have seen before, those two inland places have one of the most excessive climates in all Australia. At others it was considerably smaller; so at Fort Bourke, a place much farther inland than either of them, it was in the same year from $106^{\circ}7$ to 30° ; at Thargominda, the most remote inland station, it was from 109° to $35^{\circ}5$. On the coast the maxima are, as we have seen, about the same as in the interior, the same source, viz., the hot desert wind producing them in either case.

The minimum of the coldest inland place we have taken note of just now, of Albury, which however it must be remembered lies at the foot of the Australian Alps, is only a few degrees lower than that of some coast places. It further appears from

the figures above given, few though they be,¹ that distance from the sea on the one side, mean annual temperature and excessive climate on the other side, do not go hand in hand. Deniliquin and Albury have a more excessive climate than Bourke and Thargominda. Cowga is hotter than the latter place, though this is about 3° of latitude nearer the equator.

The explanation of the Australian continent seeming to make an exception from the rule that the climate gets excessive in proportion as we penetrate into the interior, this explanation, I say, may be found in its small extent; in its geographical position in tropical and subtropical latitudes only, by which a considerable cooling down of that central "furnace" is prevented, but the temperature is always kept on a warm level; finally, in its being to a large extent under the sway of equatorial air and sea-currents.

With this we have finished the most important chapter, that on the temperature and its fluctuations, of the first, or meteorological part of the Medical Climatology of Australia.

¹ One might object to my drawing general conclusions from a statistical material mostly based on short periods of observation, and these observations being, moreover, as is the case at the New South Wales country stations, made only once a day (at 9 A.M.). But I think it is at least something to get an idea of the Australian climate by as far as it is necessary to our purpose, whilst a professional climatologist may not be equally contented.

ON THE INTERNAL ADMINISTRATION OF CARBOLIC ACID IN DIPHTHERIA.

BY F. A. MC'EWEEN, M.B., C.M., INSCH, ABERDEENSHIRE.

IN the month of August a very fatal form of diphtheria broke out at a farm-house in the parish of Culsamond in Aberdeenshire. In a short time, of nine persons who were attacked, seven died. The practitioner in attendance about this time delivered the wife of a carpenter in a neighbouring parish, and a short time afterwards the carpenter and his five children died of diphtheria. He also attended in her confinement the wife of a farm-servant in the same parish. She took diphtheria and recovered.¹ Her husband and child took it and died. The unfortunate coincidence of the disease following so fatally in the track of the practitioner in attendance at the seat of the outbreak took hold of the public mind, and for a time the people were quite panic-struck and looked upon their medical men as dangerous mediums of infection. Throat affections multiplied, and became a cause of great anxiety.

Among a number of cases of "sore throat" which I saw about this time, I took a note of the following cases which seem to me rather interesting.

CASE I.—P. B., a farm-servant from the place where the last-mentioned cases broke out, came to me on the evening of 9th September, complaining of headache, vomiting, and "sore throat." On looking into his throat the fauces presented an angry red appearance with slight swelling. I ordered him drop doses of acid. carbolic. every three hours, and told him to use steam inhalations that night and to keep his bed next day if he did not feel better. Two days afterwards he presented himself quite recovered.

¹ She has died since these notes were written.

CASE II.—C. P., another farm lad from the same place, consulted me on the evening of 11th September. He complained of the same symptoms as the previous patient, and his fauces presented a more angry appearance. I prescribed the same treatment, and two days afterwards he was quite well.

CASE III.—R. A., another farm-servant lad from the same place, came to me on September 15th, presenting the same symptoms. I prescribed the same treatment, and he too recovered without any further development of mischief.

Comparing these three cases with the one below, the progress of which I anxiously watched, I think there is reason to infer that the carbolic acid had something to do with the non-development of the symptoms of the above cases into something more grave, and also in modifying the gravity of the case which follows.

CASE IV.—W. M., a fine strong lad of 17, from one of the places where the diphtheria had proved so fatal, consulted me on September 28th. He had come home to his father's house in the village beside me. He complained of headache, sickness, and sore throat. The fauces presented an angry red appearance. I prescribed carbolic acid in drop doses, steam inhalation and poultices to his neck as he complained of pain, and advised him to keep his bed next day and let me know if he was not better. Hearing nothing of him, I called to see him on the 30th and found him well, and, as he expressed himself, "ready for work." Appearance of the fauces normal. He left for his place next morning, but on October 3rd his throat was worse and he was driven home. I was called in to see him on October 4th, and found him in bed with flushed face, profuse perspiration, pulse 100, rather thready. Glands of neck at the bifurcation of carotids swollen and painful, headache and sickness. Nothing whatever to be seen on examining the throat. Order poultices, steam inhalation, and chlorate of potash and iron mixture.

October 5.—Had a restless night. Pulse 96. Nothing abnormal about fauces, swelling of glands and cellular tissue increased. Slight huskiness of speech.

October 6.—Had a bad night. Pulse 96, thready, hoarseness, swelling increased. Nothing to be seen on examining the throat. Dr. Davidson of Wartle saw the patient with me

to-day and advised thirty-drop doses of Tr. ferri perchl. every four hours.

October 7.—No improvement.

October 8.—At nine this morning on examining the fauces discovered a small patch on the left tonsil. Made patient rinse out his mouth with a weak solution of carbolic acid, then with a dry swab removed the membrane from the tonsil and with a soft brush (as recorded in a paragraph of *Practitioner* for October, taken from *Chicago Medical Journal*) swabbed the fauces with equal parts of Tr. ferri perchl. and acid nit. dil. At night the whole of the pharynx was covered with a pearly looking membrane, which I removed as in the morning, using the iron and acid freely.

October 9.—Patient improved upon the whole. Still hoarse. Swabbed the throat, as there was a little more exudation.

10 P.M.—Fauces clean. During the evening patient spat up some foetid matter mixed with blood from "something that had burst in the throat," as he expressed himself. Use the carbolic wash frequently. Continue poultices and steaming.

October 10.—Patient had a more comfortable night. Pulse 70, small. Swelling of glands and cellular tissue of neck subsiding.

October 15.—Patient able to get up.

After this the patient made rapid progress. All through his illness he took large quantities of beef-tea and milk, and after being satisfied that he had diphtheria I made him rinse out his mouth and gargle his throat with the carbolic wash before swallowing anything.

Reviews.

Public Hygiene in America : being the Centennial Discourse delivered before the International Medical Congress, Philadelphia, September, 1876. By HENRY J. BOWDITCH, M.D.
Boston : Little, Brown, and Co. London : Trübner and Co.

OUR first feeling on looking at this most interesting volume is that Dr. Bowditch must be richly endowed with that enormous capacity for taking trouble which is characteristic of genius. To prepare himself for writing the discourse, which covers 122 pages of large type, he issued a circular letter containing twenty questions, many of which abound in sub-heads, to an unstated number of correspondents who were supposed to be interested in public hygiene, and, as the names of those who replied cover six pages, some idea of his labour may be formed. The appendix, which fills 376 pages of small type, is to a large extent the foundation of the discourse, and contains extracts from the replies of correspondents, returns from universities and medical colleges, on the amount of attention given to instruction in public hygiene and preventive medicine, together with a digest of American sanitary law by H. G. Pickering, Esq., and three or four very short papers, of which the most important is on the Law of Soil Moisture as a cause of Consumption in Massachusetts and elsewhere. The discourse itself comprises an historical account of the gradual evolution of the idea of State preventive medicine during the centennial period, and an account of the present status of the country in reference to public hygiene and State preventive medicine as shown by an analysis of answers to the questions submitted to the correspondents. This analysis we need hardly say is ably done. The impression derived from this book confirms that from various State Board Reports which it has been our lot recently to read, and it is that upon the whole, both as regards men and measures, sanitation in the United States is far below the level even already achieved in England. Many of the men are of first-rate ability and occupy positions in the front rank of sanitary science ; but on the other hand many of the rank and file, who in

their own districts are the only advisers, exhibit a want of acquaintance with methods of inquiry and indistinctness regarding the objects aimed at by sanitary action, which we are not accustomed to in the lynx-eyed Medical Officers of Health in charge of English districts, and which must be set down to the defective character of the instructions and legal enactments under which our American brethren work. There is an indefiniteness about the registration laws in the States generally, and a want of stringency in carrying them out, which must sorely try the officials who have to deal with statistics so loosely collected. Dr. Bowditch in the preface to the English edition says: "Any one can foresee that during the next half century immense strides will be made in the United States in sanitary measures and in sanitary law. I think it very probable that in sanitary enactments more rapid progress may be made there than in many other countries. De Torqueville has sagaciously said that the American people are willing to submit to really arbitrary law with a good object in view, which a people living under a less popular government would reject." To us the most encouraging sign is the zeal and public spirit of those interested in hygiene in the States. We doubt whether in any other country of the world a circular letter—even from a person of Dr. Bowditch's reputation—would have been answered so extensively and thoroughly by unpaid correspondents.

Model Diagram of the organs in the Thorax and upper part of the Abdomen. London: H. K. Lewis.

THIS diagram, designed by Dr. A. Ferber, consists of four diagrams superimposed, the external one representing the ribs, the next the lungs and mediastinum, the third the costal pleura and pericardium, and the fourth the heart, great vessels, diaphragm, liver, stomach, and colon. This diagram is likely to be exceedingly useful to students of clinical medicine, as the first sheet admits of being folded upwards, while the second and third are divided in the middle, and can be folded to either side, so that the exact relations of the thoracic organs to each other, as well as to the chest walls, can be observed with the greatest ease.

Transactions of the American Gynecological Society. Vols. I. & II. (1877 and 1878.)

THE American Gynecological Society was instituted in 1876; its object being, as expressed in its Constitution, "the promotion of knowledge in all that relates to the diseases of women and to Obstetrics."

The inaugural meeting was held in New York in June, 1876, and Vol. I. contains the papers which were read at that meeting.

The first few pages of the volume are devoted to the list of Fellows of the Society, its bye-laws, and the proceedings of the meeting.

Then follows the annual address of Dr. Fordyce Barker, of New York, the first President.

"The status of the society in the scientific world," says he, "will be determined by the character and value of the papers published in its Transactions, and by the tone and ability of its discussions."

The contents of Vol. I. testify to the high character of the Society, for it is full of valuable papers and interesting discussions. Dr. Emmet, of New York, contributes the first paper, taking as his subject "the Etiology of Uterine Flexures, with the proper mode of treatment indicated."

He quotes from the records of some 2,447 cases, who had suffered from various diseases and injuries peculiar to women, which had come under his personal observation. The result is an elaborate paper, full of valuable statistical information; and, as regards the treatment, the deductions are well drawn.

One of the most important papers is from Dr. Robert Battey, on "Extirpation of the functionally active Ovaries for the remedy of otherwise incurable disease."

Ten cases are quoted in which the operation was performed, and in several the result was eminently satisfactory. In one only was there a fatal issue.

There are papers also by English Gynecologists, among whom Dr. Matthews Duncan and Dr. Barnes. The latter was present at the meeting, and took a prominent part in the discussions.

Among many other interesting communications are those of Dr. Gaillard Thomas, of New York, on "A case of Abdominal Pregnancy treated by Laparotomy," and Dr. Goodell, of Philadelphia, on "Some of the Genital Lesions of Childbirth."

The volume closes with a few pages "In Memoriam" to Professor Gustav Simon, of Heidelberg, who had been elected, a fortnight after his death, an Honorary Fellow, the sad news of his fatal illness not having reached America.

Vol. II. contains the proceedings of the second annual meeting, held at Boston, Massachusetts, under the presidency of Dr. Fordyce Barker, of New York. It is in no way inferior, and in many respects superior to the preceding volume.

The first paper is contributed by Dr. James R. Chadwick, of Boston; it is entitled, "The Functions of the Anal Sphincters, so-called, and the act of Defæcation." He shows that the action of the internal sphincter has been misunderstood, that it serves the purpose of expelling the fæces instead of retaining them, and he terms it a "detrusor fæcium."

A "Report on the Corpeas luteum," by Dr. Dalton, of New

York, is worthy of the highest eulogium. It is full of laborious and careful research, and the illustrations are admirably executed.

In a paper on "Amputation and Excision of the Cervix Uteri," Dr. John Byrne, of Brooklyn, runs down the wire ecraseur, and sets great value upon the galvano-cautery. It will be found in practice, however, impossible to pull down the cervix uteri so as to apply the wire; in many malignant growths the structure is too soft to admit of it; in these cases the ordinary wire ecraseur is of great service.

Dr. Battey again contributes a paper, and takes for his title, "Is there a proper field for 'Battey's operation?'" Since the publication of his paper in vol. i. he had performed the operation twice, and he had collected the details of fifteen operations by others who had followed him. The results appear to be conclusive as to the value of the treatment in well-selected cases, and in the discussion which follows the general verdict is in its favour.

The papers of Dr. Paul Mundé, of New York, on "The Value of Electrolysis in the treatment of Ovarian Disease," and of Dr. Emmet on "Congenital Absence, and accidental Atresia of the Vagina," are especially interesting.

As an appendix is issued an Index of Gynecological and Obstetrical literature of all countries, from July 1, 1876, to January 1, 1877, and it is intended each year to publish a fresh list. This should be of great value as a reference.

Sanitary Houses. By J. G. RUSSELL, M.A., M.B., B.Sc., pp. 56.

With 35 illustrations. Edinburgh: Maclachlan and Stewart.

London: Simpkin, Marshall, & Co.

THE two lectures of which this little work consists are intended for builders and plumbers, but they contain an excellent epitome of general rules regarding drainage, water supply, warming and ventilation, calculated to be useful to any one wishing to get a little knowledge of these subjects without the trouble of consulting larger works.

Clinic of the Month.

Oleate of Zinc in the Treatment of Eczema.—

Dr. Radcliffe Crocker draws attention to the utility of oleate of zinc in eczema. For this purpose it is prepared by stirring together one part by weight of oxide of zinc with eight fluid ounces of oleic acid as free from palmitic acid as possible, and after letting it stand for two hours, heating it until the zinc is completely dissolved. On cooling it forms a yellowish-white hard mass, which can be made into the consistence of ointment by the addition of one part of vaseline or olive oil, or two parts of lard or solid ointment. Vaseline is preferable, as it is not liable to change. The other preparations soon become rancid; they should therefore be freshly made, and then answer equally well and are much more economical. This preparation is very effectual in acute and chronic eczema in the discharging stage. In the dry stage it is also useful: but in many cases more stimulant remedies cure more speedily. The oleate of zinc ointment is a remedy of the same class as Hebra's unguentum diachyli; and whilst beneficial in all forms of eczema, its most striking effects, as just mentioned, are seen in the discharging stage, and so far as Dr. Crocker's experience has carried him, it never seems to do harm in any case, as happens when stimulant remedies are injudiciously applied. Dr. Crocker has treated a large number of cases with this remedy with most satisfactory results, he consequently recommends it as one of the most useful preparations for eczema that we possess. (*British Medical Journal*, Oct. 26, 1873.)

Hypodermic Injection of Mercurialised Peptone.

—Mr. Bishop reports the case of a female patient, aged 18, who was admitted into the Lock Hospital suffering from a full and general eruption of roseola and severe psoriasis on the arms and upper part of the trunk and thighs. The eruption was very obstinate and did not yield to blue-pill and opium, perchloride of mercury, the green iodide of mercury, or iodide of potassium. Ten minims of the mercurialised peptone were therefore injected into an arm every day, changing the arm at each injection. Marked benefit was soon produced, the eruption

fading, and the gums becoming slightly tender. At the end of a fortnight the injection was given every other day, until the activity of the eruption had subsided, leaving stains behind, which very soon disappeared under the internal administration of the green iodide of mercury, and local application of the red iodide of mercury ointment. Hard nodules presented themselves at the site of every injection, causing extreme pain and considerable swelling. They ultimately subsided, but the nodules are very persistent and are painful to pressure. The patient, who is under continual observation, has had no relapse of the eruption, but suffers from an ulcerated tongue. The action of the mercury was undoubtedly obtained, since the gums presented the characteristic appearance, and the breath had a mercurial fœtor. (*British Medical Journal*, Oct. 26, 1878.)

Diuretic Effect of Resin of Copaiba.—Dr. Lees reports a case of ascites occurring in the person of a spirit drinker, in which the amount of urine passed daily was forty-five ounces. The case was treated by the administration of acetate of potash, digitalis, and infusion of scopolarium, when the amount of urine diminished. Paracentesis was performed, twenty pints of fluid were removed, and the girth of the abdomen was reduced from 41.5 to 39 inches. The amount of urine passed rose to the normal amount. Three days later, as the abdomen was again increasing in dimensions, whilst the amount of urine was decreasing, fifteen grains of resin of copaiba in an ounce of almond mixture were given three times a day. The quantity of urine rose immediately. The amount passed on the first day on which the copaiba resin was taken was no less than 139 ounces—four times as much as on the previous day. For the next four days the amount was upwards of 112 ounces daily, and for the next five days the average amount was 85 ounces daily. Coincidentally with this diuresis, the girth of the abdomen continuously diminished. At the end of ten days it was five-eighths of an inch less than after the operation, and the patient was very comfortable. Unfortunately, however, the patient died from a severe attack of hæmatemesis. On post-mortem examination the liver was found to be exceedingly shrunken and hard, weighing only thirty-seven ounces, very fibrous, with little, if any, healthy tissue remaining. The spleen was large and hard. The kidneys were healthy. (*British Medical Journal*, Nov. 9, 1878.)

The Remedial Application of the Caustic Alcohols.—Dr. B. W. Richardson understands by the term caustic alcohols, the ethylates of sodium and potassium, which are substances formed by the replacement of the hydrogen atom

in alcohol by an atom of sodium or potassium respectively. On exposure to water both the potassium and sodium ethylates became transformed into caustic potash (soda), and ethyl, or ordinary alcohol. Dr. Richardson has not yet been enabled to apply these substances internally, though they are of great use for external application, since they act as most powerful caustics, whilst at the same time their action may be so regulated as to be painless. The caustic alcohols may be used in conjunction with anæsthetics, since a part which has been frozen may be entirely and rapidly destroyed by the action of these substances. Mixed with blood the caustic alcohols bring about a rapid crystallisation, at the same time vigorously attacking and dissolving the red blood corpuscles, whilst they act with comparative slowness on the white corpuscles. The ethylates possess also a powerful antiseptic property, preserving even nervous matter. Dr. Richardson recommends that the remedy should be tried in lupus, malignant ulcer, vascular cutaneous growths, and excrescences; he has himself used the ethylate in cases of nævus, with good results. (*The Lancet*, Nov. 9, 1878.)

Observations in Urinary Pathology and Therapeutics.—Dr. Ralfe has been led to investigate the action of bicarbonate of potash on the reaction of urine. Drs. Bence Jones, Beneke, and Parkes have successively noticed that the administration of bicarbonate of potash caused an increase of acidity in the urine on the following day, an observation which is at variance with the generally received opinion as to the action of the alkaline bicarbonates as antacids. Dr. Ralfe finds that when the bicarbonate of potash is taken in drachm doses an hour before meals, the acidity of the urine is lessened on the day of ingestion, but is increased on the following days. The reaction of the urine on the day of the experiment never remains alkaline for more than two hours, whilst the acid passed in the remaining three hours amounts to little less than the acid excreted in the five hours on the day preceding the experiment. Hence the excretion of uric acid is increased on the days the bicarbonate of potash is taken. When the salt was taken after food it was found that the acidity of the urine entirely disappeared, whilst on the succeeding days there was no marked increase in the acidity of the urine. The explanation of these phenomena the author supposes is to be found in the fact that when a bicarbonate is taken into the stomach before meals, it is absorbed undecomposed into the blood, causing an increase in the acidity of the urine. For the chief acid salt of the blood is bicarbonate of potash or soda, which is an acid salt with an alkaline reaction. If, however, the salt is taken during digestion, the acid contents of the stomach decompose it, carbonic

acid is liberated, which escapes by the mouth, whilst the alkaline bases are absorbed, and cause the urine to assume an alkaline reaction. The therapeutic indications to be drawn from these observations are thus summarised: (1) In cases of acid dyspepsia arising from the excessive formation of acid within the system, as in lithæmia, the alkaline bicarbonate should not be administered before, but after food; (2) The administration of alkaline bicarbonates before meals is indicated in those cases where the free acid is formed in the stomach itself, the result of fermentative changes of undigested food or morbid mucus, when it is necessary to diminish the too high degree of acidity thus caused in order to allow digestion to be properly performed. (*The Lancet*, Nov. 9, 1878.)

Treatment in Cases of Excessive Lochial Discharge.—Dr. Hugh Miller, in a clinical lecture delivered at Glasgow, recommends the following prescription in cases in which there is an excessive discharge, accompanied by a relaxed condition of the uterus. He administers ʒj. doses of liquid extract of ergot repeated every three or four hours, and

R Quinin sulph.	. . . .	ʒss.
Acidi hydrobrom.	. . . .	ʒvj.
Aquæ add	. . . .	ʒij.

Dose, ʒi. in aq. ter. in die.

By this method large doses of quinine may be given without causing headache. In septic cases Dr. Miller advises the employment of sulpho-carbolate of potash, in the form of powders, in doses of 10—15 grains internally three times a day. When the discharge is suspended the treatment consists of turpentine stupes applied over the lower part of the abdomen, with the addition of warm moist cloths, or of sponges, pressed out of hot water, and applied to the external parts. In special cases, which require an antiseptic plan of treatment, Dr. Miller makes use of a solution of thymol, one part to 500 parts of water, or, better, three grains of thymol to an ounce of Eau de Cologne. This mixture, which has a pleasant and rather refreshing odour, is simply sprinkled over the napkins before they are used. In severe cases, with a putrid odour, a solution of permanganate of potash, injected with Higginson's syringe, provided with a vaginal portion, is made use of; the injection of the fluid is continued till it returns unaltered in colour. In all cases where the discharge is excessive, tincture of arnica is employed; the tincture is used in the proportion of one teaspoonful to a cupful of water; it acts as a mild astringent and disinfectant. (*Edinburgh Medical Journal*, Nov. 1878.)

Treatment of Neuro-Retinitis.—Dr. Hubbard, of New York, makes the following comments on the practical lessons to be learnt from a case of neuro-retinitis due to inflammation of the dura mater, which has lately occurred in his practice. Where it is difficult to make a blister draw, a blister is much needed; the longer a blister discharges—other things being equal—the more good it does. If bromide of potassium be given to relieve the engorged cerebral vessels, it should be given in large and often repeated doses. In giving stimulants in exhaustion, give all that is needed without reference to the amount. Dry heat is a powerful stimulant; in collapse it is the sheet anchor. It will affect an inactive kidney more quickly than any medicine. Iodide of potassium has a wonderful power over chronic inflammation of the cerebral meninges. (*New York Medical Journal*, Sept. 1878.)

On the Administration of Iodine.—Dr. John Dougall, arguing from the fact that about three-fourths by weight of iodide of potassium is pure iodine—as is shown by the relative doses of the two drugs—proposes that free iodine should be administered in the place of potassium iodide. In either case the same therapeutic effects are obtained, and if the iodine were administered *per se*, a saving of considerable expense would be made, as the iodide of potassium is somewhat costly. During the passage of iodine through the blood it becomes converted into iodides and iodates, whilst iodide of potassium undergoes no change, and passes out of the system undecomposed. Hence the action of the iodine in iodide of potassium is greatly enfeebled by its union, in reference to the systematic effects, so that the greater part of the iodide of potassium given is simply wasted. Hence it seems that the administration of small doses of iodine is in every view preferable to that of large doses of iodide of potassium. The objection to the use of iodine by itself lies in its irritating properties, but these in moderate doses—ten minims of the tincture equal to a quarter of a grain of pure iodine—may be sufficiently subdued by a mixture with from half a dram to a dram of aqua chloroformi, glycerine, or, better still, with syrup of tolu, but probably no substance disguises the taste of iodine so much as sweet milk. Ten drops of the former added to half an ounce of the latter form a bland mixture, at first yellow, becoming purely white in about an hour. (*The Glasgow Medical Journal*, Nov. 1878.)

Croup cured by Sulphate of Atropin.—Dr. de Pontives of Antibes, publishes a full account of a case of croup in which a fatal termination seemed inevitable, but which terminated favourably, owing, as the author believes, to hypodermic injections of sulphate of atropia. On the third day of the attack, the

patient—a child three years old—to whom the usual remedies had been given, was found to be in a state of commencing asphyxia. Three drops of a one per cent. solution of sulphate of atropia were injected by a Pravaz syringe on the left side of the neck, on a level with the pneumogastric nerve. At the end of a few minutes a change for the better took place. Four hours afterwards the child was tranquil, and though the respiration was still troubled, dyspnoea was no longer intense. A second injection was given, and the amelioration afterwards became very marked. A few days afterwards the recovery was complete. The treatment adopted was founded on the theory that asphyxia in croup is due to the more or less complete paralysis of the pneumogastric. (*L'Union Médical.—The Dublin Journal of Medical Science*, Nov. 1878.)

Dialysed Iron as an Antidote for Arsenic.—Mr. R. V. Mattison (*American Journal of Pharmacy*) has performed some experiments to test the value of a solution of dialysed iron as an antidote for arsenic. He found that a pure solution of the iron compound had no effect upon a pure solution of arsenic, nor upon one containing hydrochloric acid, but if added to the mixture of a solution of arsenic, and an artificial gastric juice, the arsenic was rendered insoluble. This action of the gastric juice is owing to the neutral salts it contains; hence, whenever dialysed iron is administered as an antidote for arsenic, it should be mixed with common salt. This acts by precipitating from the dialysed iron solution ferric hydrate (sesquihydrate of iron) which has long been used for this purpose. In dialysed iron, therefore, we have a compound from which may be immediately obtained ferric hydrate in a form suitable for administration at once. Of course the arsenical compound, insoluble or but slowly soluble in the fluids of the stomach and intestine, should be removed as soon as possible from the stomach by an emetic or stomach-pump, and from the intestine by a cathartic. (*Dublin Journal of Medical Science*, Nov. 1, 1878.)

The Pathology and Treatment of Headache.—Dr. Day in a clinical lecture delivered at the Samaritan hospital considers the various forms of headache, and their appropriate methods of treatment. Headache occurs in cases of anæmia, and in hyperæmia. In headache from cerebral anæmia the pain is referred to the top of the head, which often feels hot and burning; whilst in headache from hyperæmia the pain is frontal, throbbing, and bursting. Dr. Day further distinguishes in headache common to both sexes, a sympathetic variety due to some eccentric cause of irritation; nervous headache caused by temporary derangement of the nervous centres; and neuralgic headache. Headache also arises from menorrhagia, and from

the action of poisoned blood upon the nerve centres; organic headache is brought about by morbid changes within the skull. Headaches are of frequent occurrence in children, and if persistent are very significant, and should invite more serious attention than a similar disorder in the adult. As to the treatment of headache Dr. Day advises as a preliminary step a diligent search after the cause of the disorder, which, when found, should be removed as speedily as possible. The remedies to be used are tonic or calmative as the case may require. If the brain be over-excited, bromides of potassium and ammonium, chloral hydrate and morphia as a hypodermic injection or in other form, may be used. The morphia combined with an infinitesimal dose of atropia, and used with care has been found to be an invaluable remedy, even in cases of organic disease. In nervous headaches a stimulating emetic of sulphate of zinc, mustard or ipecacuanha will act like magic, as will also a mustard-leaf at the back of the neck, the feet and legs being at the same time put into hot water. In the neuralgic variety tonics are serviceable, especially cod-liver oil, phosphorus, quinine, and arsenic. The local application of aconitina ointment is serviceable in that form known as brow ache. As a general treatment it is recommended to elevate the head at night, and to make use of a hard pillow. In every case the first principle to inculcate is rest. (*British Medical Journal*, Nov. 16, 1878.)

Treatment of some Forms of Delirium Tremens.—

Dr. Broom has successfully treated a case of delirium tremens with chloride of ammonium administered in twenty-grain doses every four hours. During the first night the patient slept for several hours, and was perfectly well on the third day. The *rationale* of the treatment adopted was that the delusions were due to a hyperæmic or hyperæsthetic state of the auditory nerves. In a second case of the same disease the patient was packed in wet sheets, covered with blankets, and placed on a horse-hair mattress. A pint of warm milk in which an egg and a tablespoonful of brandy had been previously mixed were then administered, and the patient slept for a period of ten hours. The next day there was a marked improvement in his condition, and the process was repeated upon the second and third day with progressive results, after which there were neither tremors nor hallucinations. (*British Medical Journal*, Nov. 16, 1878.)

Extracts from British and Foreign Journals.

The Tropical Application of Chloral Medicated with Camphor.—The mixture of chloral and camphor is transformed by heat into a thick oily transparent liquid, resulting from the solution of the camphor in the chloral hydrate, which thus loses its proportion of water. This topical application does not act like chloral by revulsion, for it does not produce the slightest hyperæmia of the skin. Its action appears therefore to be due to its absorption. Dr. Sune who has made out these facts, has seen several cases of pain in the side and slight attacks of neuralgia cured by this new medicine. (*In-dependencia Medica.*)

Intravascular Injections of Pure and of Defibrinated Blood, and of Milk.—M. Brown-Séquard has for a considerable period made experiments or intravascular injections of pure and of defibrinated blood, as well as of milk. The experiments have been made quite simply; defibrinated blood may be injected into various species of animals; if the blood of a bird be injected into a mammal, the globules rapidly disappear. If milk be injected into blood the milk globules likewise disappear very quickly; but M. Malassez has proved that more white globules are to be found after the injection. Milk injections have been successfully made on man by several American physicians; M. Brown-Séquard showed a healthy dog into which five months previously he had injected 92 grammes of milk in place of 95 grammes of blood. He repeated the experiment, and believes now that the quantity of milk injected should equal that of the blood which is taken away. If this is so, what is to be the limit? Water injected into the blood-vessels after loss of blood only hastens death; under very different conditions Lorain was able to save a choleraic patient by injecting warm water, a case brought to mind by M. Moreau. M. Brown-Séquard injects the liquid cold, a proceeding which does not cause the shivering that is often seen during

transfusion in man, since he injects by the arteries, and so slowly that the temperature becomes equalised; and also because the liquid is one that rapidly assimilates with the blood. (*Le Progrès Médical*, Oct. 19, 1878.)

Iodide of Potassium in Small Doses in Persistent Vomiting.—Dr. Formica Corsi states that iodide of potassium given in small doses cures obstinate vomiting which has resisted the ordinary treatment. In a case of a pregnant woman suffering from typhoid fever, Dr. Corsi administered two centigrammes of iodide of potassium dissolved in 100 grammes of water in a teaspoon every hour and a half. The vomiting, which had previously resisted all known anti-emetics, ceased on the following day. Dr. Giné confirms the anti-emetic properties of iodide of potassium; and he uses the medicine in doses of one to five centigrammes daily for the cure of constipation, as he finds that it acts as a laxative. (*Independencia Medica.*)

Hydrobromate of Quinine as an Antipyretic.—Dr. Esquerdo administered this salt to a typhoid patient whose temperature had been 40° C. for several days; two days afterwards the temperature was reduced to 36° C. At this point as the author feared collapse, since the reduction had been so considerable, the hydrobromate of quinine was no longer given; the temperature became higher. In two cases of phthisis the hydrobromate caused a disappearance of the feverish symptoms and swellings. The dominant action of hydrobromate of quinine consists in its power of causing a lowering of temperature and of diminishing the frequency of the pulse whilst it increases its amplitude. The observations of Dr. Esquerdo are corroborated by Dr. Cahis, who has observed in a typhoid patient a lowering of temperature from 41° to 39° or even to 38° C. brought on by the administration of fifty to seventy centigrammes of the hydrobromic salt. (*Independencia Medica.*—*Gazette Médicale de Paris*, Oct. 12, 1878.)

Treatment of Diphtheria.—M. Kien, in the late epidemic of diphtheria at Strasburg, has found that Schaller's method of treating diphtheria with perchloride of iron—twenty drops in twenty drops of water, in a teaspoonful or two of coffee every two hours—was exceedingly effective. In some cases, in which the medicine did not act sufficiently rapidly, M. Kien has given in addition syrup of eucalyptus, according to the plan of M. Goldschmidt. If the patients refused to take the perchloride of iron, a lotion was employed, such as was

proposed by M. Mandl, of Paris, for application in chronic granular pharyngitis. The lotion was applied by means of a brush, as a wash for the sore places, two or three times a day. It was composed of carbolic acid, 0·10; pure iodine, potassium iodide, 0·20; glycerine, 10·00. Independently of this, he gives salicylate of soda, $\frac{1}{100}$, if symptoms of fever present themselves; the drug acts in the same way as sulphate of quinine, whilst it is more easy to administer in a liquid form. (*Gazette Medicale de Strasbourg*, Nov. 1878.)

Treatment of Chronic Eczema by Glycerole of Subacetate of Lead.—Dr. Squire advocates the mixture of the preparation with vaseline, six parts of the former to twenty-eight of the latter, and the employment of this ointment in various forms of chronic eczema. (*Pamphlet*, London: J. & A. Churchill. 1878. Second Edition. Appendix.)

Professor Neumann on Chrysophanic Acid in Skin Disease.—The conclusions arrived at by Professor Neumann after using this remedy are as follows:—The acid obtained from Goa powder is an excellent remedy for tinea tonsurans, tinea versicolor, and psoriasis. The early forms of the latter disappear after a few applications only, and do so more quickly and in a far simpler way than under any hitherto known remedy for the disease. Inveterate forms of the affection also are capable of being subdued by chrysophanic acid, and offer long resistance to it only in exceptional cases. It produces no pain in the affected parts. By its means psoriasis has been removed from the list of affections which torment patients to an excessive degree, and its relapses are easily controlled. In tinea versicolor three rubbings with the ointment, in tinea circinata from six to eight, are generally sufficient for a cure,

Traumatic Tetanus successfully treated by Calabar Bean and Whisky.—Dr. Burke reports two cases which occurred under his control in New York. In the first case the patient had stepped upon a rusty nail ten days previously, and was, when seen, suffering from marked stiffness of the lower jaw, stiffening of the abdominal muscles, difficulty in swallowing, and continuous perspiration. Drop doses of fluid extract of physostigma, of a strength of 60 grs. to the drachm, were first ordered, together with castor oil, as the breath was foul. On the following day the dose of calabar bean was increased, a drop being given every half-hour, combined with $\frac{1}{2}$ of whisky, the whisky being administered to counteract the depressing effects of the calabar bean. Finally the dose was gradually raised till gtt. xiii. of the fluid extract of calabar

bean were administered every half-hour, whilst as much as two pints of whisky were given daily; the other ingesta being always fluid, consisting of milk, eggs, and beef-tea. As good effects were produced, the quantity of the extract was gradually reduced, and finally, in about six weeks, entirely discontinued, good care and nourishment completing the cure. In a second case the dose was gradually raised till gtt. xv. of the fluid extract were given every half-hour, whisky being always administered; the full physiological action of the drug was obtained by injecting hypodermically ℥xxii.—℥xxxiii. of the alcoholic extract of the calabar bean every hour; ℥ss. of whisky were also given by hypodermic injection, and about ℥i. by the mouth. The patient steadily improved under a treatment in which the alcoholic extract was injected hypodermically in doses ranging from ℥x. to ℥xxv. every hour, and was ultimately discharged cured. (*New York Medical Record*, July 6, 1878.)

Chlorate of Potash in Catarrh of the Bladder.—Professor G. Edlefsen of Kiel publishes an essay on treatment of catarrh of the bladder by chlorate of potash. The view lately advanced, that the best method of treating cystitis, even in acute cases, consists in the introduction into the bladder, through the urethra, of water or medicated fluids, is not in accordance with his observation. The remedy he recommends is chlorate of potash internally, which never damages the stomach or any other organ, and substitutes turpentine perfectly in cases where turpentine can be given. (*Deutsch. Archiv. Klin. Med.* xix. i. 1877.)

Treatment of Asthma.—M. Sée treats asthma with iodide of ethyl and iodide of potassium. The former is given by inhalation during dyspnoëic attacks; from five to ten drops constitute a dose, and the effect is said to be very rapid and satisfactory. The potash is given in the intervals between the attacks to ward off their recurrence. M. Sée gives it in large doses, from twenty to forty-five grains per diem. He is not afraid of iodism, which he combats merely by increasing the dose of the drug. In twenty-four cases treated in this way, which have been under observation for several years, his success was very gratifying. (*Gaz. Méd. de Paris*.)

Use of Chloride of Potassium in Epilepsy.—Dr. E. C. Seguin has come to the following conclusions, based upon a large experience of this drug. (a.) Chloride of potassium is not efficacious in the treatment of epilepsy. (b.) The bromides are positively useful in reducing the number and severity of epileptic attacks. Observations have also been made upon a

mixture of chloral and the bromides, and the following deductions drawn. (a.) The epileptic attacks are warded off quite as well by this as by bromides alone. (b.) The reflex power of the throat has been abolished quite as well as by the ordinary bromic solution. (c.) There has been remarkable immunity from the bad effects of the bromides, more especially those which manifest themselves in the psychic sphere. (d.) No really bad effects resulting from this mixture have been noticed. A more extended trial of this combination in epilepsy is recommended. (*New York Medical Record*, June, 1878.)

Belladonna as a Stimulant to the Circulatory System.

—Dr. Reinhard Weber has used belladonna with good effects in severe cases of collapse occurring during attacks of scarlet fever, typhoid fever, and gastro-enteritis. He was led to administer the drug from the knowledge of the fact that belladonna increases the blood-pressure by stimulating the vaso-motor centres. Dr. Weber further proposes the same remedy as part of the treatment in all cases of collapse or shock in which danger threatens from failure of the circulation. As a case in point he instances one of his patients who, suffering from serious valvular disease of the heart, was so greatly relieved by a prescription containing ext. bellad., potass. acetat., and syrup. tolutan., that a week later the patient was comparatively cured. During the administration of the belladonna the amount of urine passed was very large, and as a consequence the effusions disappeared very rapidly, more especially the pericardial effusion, as the cardiac dulness was reduced to two-thirds. The action of the kidneys was the more remarkable as diuretics had previously been used largely, but without effect. Dr. Weber attributes the increased flow of urine to the larger supply of arterial blood brought to the kidneys, owing to the stimulating effects of the belladonna upon the vaso-motor centres and the excito-motor ganglia of the heart. (*Philadelphia Medical Times*, July 6, 1878.)

Iodide of Ethyl in Asthma.—Professor Sée has employed inhalations of this substance in five cases of asthma, and the paroxysm was arrested in all very rapidly. In three cases of cardiac dyspnoea it also acted favourably; and in two cases of chronic bronchitis, accompanied by dyspnoea, the effect, although much less prompt, was advantageous. Quite recently, in a case of œdematous laryngitis, inhalations repeated ten or twelve times a day effected a cure. Like the iodide of potassium, the iodide of ethyl increases the bronchial secretion, and by this hyper-secretion renders it more fluid, and thus favours the admission of air into the pulmonary alveoli. The iodine stimulates the action of the respiratory centre, and by reason of the greater

quantity of blood this is brought into contact with, respiration becomes more easy, being still further aided by the ether in combination with the iodine. The general conclusions to be drawn from the paper are—1. Iodide of potassium constitutes the most certain means of curing asthma, whatever its origin may be. 2. The iodide of ethyl relieves the paroxysms of asthmatic dyspnoea with great rapidity. It also appears to act advantageously in cardiac and even in laryngeal dyspnoea. (*Medical Times and Gazette*, February 9, 1878.)

Veratrum in Acute Pneumonia.—Mr. Stewart, of Cuttack, India, finds that veratrum is useful in those cases of acute pulmonary affections of children, in which it would be unsafe to administer antimony as being too depressing in its effects. In one of his cases—occurring in a European of six years of age—in whom the inflammation of the lungs was already far advanced, and upon whom severe counter-irritation and antiphlogistic treatment had been unavailing, Mr. Stewart resolved to administer veratrum as a last resource. A tincture was prepared of which 3℥ = 1-40 gr., and of this 4 to 6℥ were given frequently. All other treatment was stopped except that a soft, warm bread and linseed poultice was applied to the front and back of the chest every six hours. The progress of the case under veratrum was uninterrupted, and in a few days the lad was convalescent. Six weeks later a fresh cold brought on a recurrence of the old symptoms, which were, however, quickly controlled by 4℥ doses of veratrum. A younger child attacked with severe catarrh, followed by broncho-pneumonic symptoms, was relieved by the same drug. (*Indian Medical Gazette*, June 1, 1878.)

Potassium Bromide in Puerperal Convulsions.—Dr. Henry Field has been led to the conclusion that if potassium bromide is to be employed in cases of puerperal convulsions, it must be applied with a free hand and in large doses. Acting upon this theory, he administered, in the course of seven hours, 3vss of potassium bromide, in doses of sixty grains each, to a patient in labour suffering from puerperal convulsions. The conclusions at which he arrived in reference to this case are, that the patient was not injured by the free administration of the drug, but, on the contrary, the large doses kept off the convulsions, and enabled the uterus to complete the labour without further complication. Several hours after confinement there appeared suddenly another convulsive seizure, which was controlled by returning to the bromide in 3ss doses, three or four times a day. On again suspending the remedy, the convulsions again returned, and this happened several times in the fortnight

following parturition. The patient ultimately made a good recovery. (*New York Medical Record*, June 1, 1878.)

The Treatment of Struma by Injection of Ergotin.—Subcutaneous injections of ergotin were administered to a country girl, aged seventeen, affected with struma vasculosa, exophthalmia, and occasional palpitation of the heart. The injections of ergotin proved to be inactive, the injection was therefore made into the parenchyma of the tumour. After three injections the tumour was entirely gone, and it has not reappeared after the lapse of some years. An unilateral throbbing pain in the head came on after the first injection, accompanied by a sensation of heat in the corresponding half of the head, in the cheek, and in the ear; there was reddening of these parts. The conclusions to be drawn are, that even when the paralysis of the sympathetic is marked, ergotin must act by causing contraction of the blood-vessels. (*Allg. Med. Centralztg.*, 1878, No. 11.)

Treatment of Rhus-poisoning.—Dr. Brown, surgeon in the United States Navy, believes that he has discovered in bromine a "specific" cure for the cutaneous inflammation produced by contact with the volatile poison of this family of plants. He states that he has used the remedy in forty cases, with the same unvarying success; that the eruption never extends after the first thorough application, and promptly begins to diminish; the patient being entirely cured in twenty-four hours if the application be persisted in. He uses the bromine dissolved in olive oil or cosmoline, ten or twenty drops to the ounce, rubbing it gently upon the affected parts three or four times a day, and washing off the oil twice a day with soap. There is no pain attending its use. The bromine is so volatile that it is necessary to prepare the mixture afresh every day. (*Boston Medical and Surgical Journal*, June, 1878.)

Pilocarpin in Children's Diseases.—Professor Demme of Bern has recently given an extended trial to pilocarpin in various dropsical affections of children. The cases treated were thirty-three in number, and the remedy was administered subcutaneously. Eighteen were cases of desquamative nephritis with dropsy after scarlet fever; in three the same affections after diphtheria. In the remaining twelve cases the dropsy was due to valvular affections of the heart, rheumatism, acute lung affections, &c. The age of the patients ranged from nine months to twelve years; the dose varied from five milligrammes to two centigrammes. In some of the cases from two to four injections of a centigramme each were made in the twenty-four hours. Only in two cases were there any unpleasant symptoms, such

as vomiting, hiccough, paleness of face, prostration, convulsions. In these cases the peculiar effects of the remedy were not observed. Professor Demme regards pilocarpin as an excellent diaphoretic and sialagogue. The former effect is more marked in older children, the latter in younger patients. Three to seven minutes usually suffice for the effect of the drug to be produced; this goes on increasing for fifteen minutes, and remains at its height for half an hour or more, and then gradually subsides. There is slight diminution of temperature. The pulse is increased in volume and in frequency by from twenty to sixty beats. As a result of the full effect of the pilocarpin there is a loss of weight varying from 120 to 675 grammes. Diuresis is only occasionally observed. There was watery diarrhoea in two cases. Professor Demme thus summarises his experiences of the remedy:—1. Pilocarpin is an efficacious diaphoretic and sialagogue in the treatment of certain diseases of children. 2. In appropriate doses it is well borne by the youngest patients. 3. Unpleasant symptoms are of very rare occurrence, and can probably be altogether prevented by administering small doses of brandy before the injection. 4. The cases for which pilocarpin is especially suitable are the parenchymatous inflammations of the kidney with dropsy following scarlatina and diphtheria; in the majority of these cases the flow of urine is decidedly increased, while the quantity of blood and albumen in the urine is diminished rather than augmented. 5. It is uncertain whether pilocarpin has any direct influence upon the action of the heart. (*Medical Examiner*, July 18, 1878.)

A Substitute for Cod-liver Oil.—Dr. Sherwell proposes to use flax-seed oil in cases of cutaneous disease in which marasmus from defective assimilation of the hydrocarbons is a prominent feature, and in which cod-liver oil is not well borne. As is known, ground flax-seed is largely employed commercially to form the “cake” used to fatten cattle and horses, and to improve their coats. The better qualities of flax-seed contain about 30 per cent. of oil. The seed may be given by taking it when freshly ground into the mouth, and thoroughly masticating it before swallowing: by giving it suspended in milk, or by using the unbroken seed, the patient carrying it about with him, and chewing portions of it from time to time; the mastication must be thoroughly performed before the seed is swallowed. No unpleasant symptoms have followed Dr. Sherwell’s experiences; the stools are rendered easy and natural, without any tendency to diarrhoea, or other unpleasant complications. The general nutrition and the skin of the patients suffering from pemphigus foliaceus, pityriasis rubra, lichen planus, and lichen ruber, has decidedly improved under this mode of treatment. In procuring

the seed, the Calcutta seed is found to be the best, and care must be taken that it is free from admixture with other seeds, chaff, dirt, &c. (*Medical Record*, April, 1878.)

Hypodermic Injection of Dialysed Iron in Chlorosis.—Professor Da Costa reports vast improvement in the condition of a young woman, aged twenty-one, suffering from chlorosis after the injection of dialysed iron hypodermically for a fortnight. Hitherto iron has not been used in subcutaneous injections, as it is liable to cause irritation and abscesses, even with the tartrate, which is one of the mildest forms. The solution of dialysed iron was found to be free from these drawbacks, even when used undiluted. The punctures caused by the syringe showed no sign of inflammatory action. In no case was there that costiveness or disordered digestion which are but too often the after-effects of the use of iron. Daily injections of fifteen minims of pure dialysed iron were at first given, and this was gradually increased to twenty, twenty-five, and thirty minims per day. Under this treatment the colour gradually came back to the patient's lips, gums, and tongue; her appetite was good, her bowels regular, and her headache gone. She was considered practically cured. (*Philadelphia Medical Times*.)

In relation to this mode of treatment, Dr. Kemp of New York states that the injection was followed by an abscess, which lasted for about a week. He is answered by Dr. Lamadrid, who finds that the injection causes at the time a good deal of pain, followed by soreness and tenderness, as well as swelling and redness. The pain and swelling soon subside on the constant application of cold water to the parts. In spite of these drawbacks the operation of the iron is said to be most beneficial, the patients feeling decidedly better and stronger. (*New York Medical Record*, July 6 and 15, 1878.)

On Albuminuria in Chronic Drunkards.—Dr. Fürstner has found albuminuria in brandy drinkers, although he is unable to confirm the results of Hüppert, who detected it in epilepsy. It was not constant in simple or chronic drunkards, but it occurred in forty per cent. of patients suffering from delirium tremens; and the strength of the albuminuria was proportional to the intensity of the delirium, and varied with it. In drunkards suffering from nephritis, the amount of albumen increased or decreased with the delirium. Microscopic examination showed cysts and occasional blood corpuscles. The appearance and disappearance of the albumen with the delirium showed that in these cases it had no complicating action upon the nephritis. It can only be considered as due to a functional disturbance of the circulation in the kidneys, or to a cerebral process; possibly to

an antecedent disturbance of the "albumen centre" in the medulla, if such a name can be applied to the point above the so-called diabetic centre in the brain. The determination of the albumen was made according to the method advocated by Heintz, of adding to the urine to be tested one-third of its volume of acetic acid; a similar quantity of a concentrated solution of sodium chloride, or sulphate, was also added. The urine was boiled, and allowed to stand for twenty-four hours. (*Arch. f. Psychiatr. u. Nervenkrank.*, 6, *Rundschau*, June, 1878.)

Of the Nature of Mumps.—M. Fehr, after observing several cases of mumps with the greatest exactness, decides that it is right to consider the disease as infectious, and that, as was already noticed by previous observers, it stands in a definite relation to acute exanthema, particularly to scarlet fever. The occasional swelling occurs in the neighbourhood of the glands themselves, whilst the surrounding tissues only become infiltrated at a later period. It is, to say the least of it, inaccurate to describe the disease as periparotitis, as is usually done; that it is not parotitis is shown by the fact that in very many cases of mumps it is the sub-maxillary which is either affected alone, or is swollen at first. The infection is not due to the propagation of inflammation of the mouth caused by secretions from the glands. The observation that in most epidemics of mumps there is a period of incubation lasting several days with the well-known febrile symptoms before the appearance of the local symptoms, as well as the spread of disease not only to surrounding persons, but also to the foetus, argue for a specific alteration in the blood. The swelling of mumps is not a catarrhal inflammation, but a morbid swelling of the glands depending upon varying hyperæmia, which only occasions collateral hyperæmia and infiltration of the neighbouring tissues, when there happens to be a stoppage of blood in the glands. (*Von Langenbeck's Archiv.*, xx., p. 600. *Rundschau*, June 1878.)

On the Return of Sensibility under the Influence of Metallic Applications in Hemianæsthesia of Cerebral Origin.—A female was paralysed for twelve years on the right side, and was affected with chorea; the right side was insensible, and sight, taste, and smell were greatly damaged upon that side. Several applications of gold and iron rings for the arm and foot restored sensibility to the previously insensible side, lessened the strength of the unilateral chorea movements, restored the power of sight, taste, and smell on the right side. This improvement occurred after the symptoms of the disease had endured for twelve years, and when the results were once obtained they remained for months. In this case there was no hysteria,

but a well-marked organic cerebral diseased abscess in the posterior part of the inner capsule.—(*Centralblatt*, 18, p. 623).

Upon Croup and Diphtheritis.—Dr. Carl Weigert, in his researches on croup and diphtheritis, assumes a purely anatomical position, and asks by what pathological event the inflammation of croup and diphtheria is caused. The investigation of the croup membrane, artificially produced by ammonia in the trachea of a rabbit, gave the following results:—The lower surface consisted of a layer which swelled out to form an epithelium on treatment with dilute acids. Above this was a fine meshed network, the meshes of which were parallel with the surface of the trachea, and which was sometimes traversed by a greater or less number of nuclei. Finally, upon the surface, were large cells with larger nuclei, pigment, and masses of mucus; these cells were situated between the uppermost delicate fibres of the network. The network of fibres is composed of coagulated fibrin. The fibrin is not produced in the cells of the basement membrane, or in those of the epithelium; neither is it derived from the blended protoplasmic cells (Oertel), but from the connective tissue. The sinking of the epithelial layer to the basement membrane was a necessary condition for the formation of the fibrin clot. If an experiment is so ordered that the epithelium and the whole blood-vessel bearing mucous membrane is removed with a pair of forceps, it will be found that a croup membrane is no longer formed at this spot. The preservation of this mucous membrane, in which run blood-vessels, is also a necessary condition for the formation of a croup membrane. Still the separated mucous membrane possesses the power in the highest degree of allowing white blood corpuscles to move along its surface, and these are the bodies which, according to Alexander Schmidt, chiefly furnish the fibrino plastin and fibrin ferment, whose union with fibrinogen cause the appearance of a fibrin clot. The white blood corpuscles are either dissolved or broken up into a heap of granules, or they are partially enclosed in masses of fibrin. This method is distinctly separated from the formation of pus, in which there is no destruction of the white blood corpuscles, which remain intact. (*Rundschau*, May 1878, p. 352.)

Signs to Determine whether a Child has Breathed.—Prof. Giovanardi has been engaged in researches upon this subject and the conclusions at which he has arrived are the following. The lungs of a child which has breathed sink in water, if allowed to remain eleven or twelve days immersed in water. When the entire body of a child which has breathed, is placed in water, the chest being closed, the lungs will continue to float up to their entire destruction by putrefaction. When

the cavity of the chest is opened so that the water may have free access to the lungs, the lungs will sink after fifteen to twenty days immersion of the body. In cases in which the body of a new-born child is found cut to pieces, the chest opened, and the lungs exposed (to the action of water?) an expert must not infer that the child has not breathed because the lungs sink in water. By drying the lungs an expert may determine whether the sinking in water is owing to their not having breathed. If they have breathed, and have been several days immersed in water, they will after drying, float, while if they have not breathed they will in the dried state again sink. In reference to this condition, an expert may sometimes form an approximate judgment of the time which has elapsed since the death of the new-born child. Thus spontaneous submersion takes place in from eleven to fifteen days, and some days earlier if the breathing has been imperfectly performed, or if the lungs are cut in pieces or are in a putrefied state. (*London Medical Record*, 1878.)

On Unilateral Contraction of the Heart.—Von Malbranc reports the case of a woman aged 56, with dropsical symptoms, and with a venous and liver pulse, who was brought to Strasburg. There were well-marked systolic murmurs over the heart at the climax of the second pulmonary sound, an occasional intermittence of the arterial pulse could be recognised, so that as a rule every alternate beat was wanting, or was only just perceptible, when the heart was beating very rapidly. After removal of the dropsy by digitalis the action of the heart was in part quite normal, with a pulse-frequency of 72 to 80 beats per minute. The pulse was, however, in part also intermittent, with 36 to 40 normal beats, which corresponded to 72 to 80 contractions of the heart, and to as many pulsations in the veins and liver. Over the heart a feeble systolic murmur, with whistling in the neighbourhood of the left mammillary line, was heard. It was clearly determined that the sound over the heart at each second shock, to which there was no corresponding arterial pulse, was distinctly louder than that which was heard at the first; that the rhythm of the sounds was more rapid than that of the sounds of the first part of the heart's action to which an arterial pulse corresponded: that at each second shock of the heart the whistling in the middle region was wanting; finally, that the sound of impact which reached its greatest intensity at the first beat of the heart was at the second entirely wanting. At the autopsy a relative inefficiency of the tricuspid and mitral valves was found, and as a consequence hypertrophy and dilatation of both ventricles. Von Malbranc arrived at the conclusion that the heart had acted normally

in all its parts only at its first beat, and that at each second beat it was the left half alone that had contracted in such a way as to do work. He holds, in opposition to Leyden, (who believes that these "semisystolies" are a kind of compensatory antecedent), that they are a dangerous accessory to valvular disease. The author also throws out the hypothesis that the so-called pulsus trigeminus alternans is frequently due to semi-systolic action of the heart. (*Deutsch. Zeitschr. f. Prakt. Med.*, 1878.)

Diagnosis of the Persistence of the Ductus Arteriosus.—

M. Fr. Franck makes an interesting communication to the French Association for the Advancement of Science, in regard to the diagnosis of the persistence of the ductus arteriosus. The diagnosis is founded on the following signs:—The existence of a systolic murmur behind the chest, on the left side of the vertebral column between the spines of the vertebræ and the vertebral border of the scapula, about the level of the third and fourth dorsal vertebræ. The strengthening of this murmur during inspiration. The marked increase of the effects of respiration upon the arterial pulse. The absence of cyanosis if there are no other congenital lesions. (*Arch. Gén. de Méd.*, Oct. 1878, p. 481.)

Iodoform Formulæ.—No. 18 of the *Mittheilungen des Vereins der Ärzte in Niederösterreich* contains some remarks on iodoform and several formulæ for the use of this remedy.

Iodoform is given in doses of from 5 to 10 centigrammes ($\frac{3}{4}$ to $1\frac{1}{2}$ gr.) three or four times daily, in solution in ether, in powder, or in pills. For ointment one part of iodoform is mixed with eight or ten parts of fat at the temperature of a water-bath. Rubbed to a fine powder, it is used for sprinkling and dressing varicose ulcers, cancerous and syphilitic ulcers, fissures, &c. Mixed with lycopodium, it is used for insufflation in angina, and for sprinkling in the vulvitis of children.

Righini's Iodoform Paper.—Take of starch 20 parts, cold water 15 parts. Mix and add 100 parts of boiling water, or enough to make a softish paste, to which add 10 parts of iodoform. The paste is then spread thinly on bibulous paper. The paper is used for disinfecting purposes in dwellings and sick rooms; strips being laid in different parts of the room.

Iodoformised Collodion (Moretin).—Dissolve 5 parts of iodoform in 100 of collodion; mark "For external use." Used in arthritis and rheumatism.

Iodoform Suppository (Purdon).—Iodoform, 1 part; cacao oil, 25 parts. For application to the cervix or cavity of the uterus as an anodyne.

Iodoformised Cod-liver Oil.—Dissolve 1 part of iodoform in 200 of cod-liver oil, and add 0.5 of oil of aniseed. The

dose is a table-spoonful three times daily in phthisis, glandular affections, and scrofula.

Anti-rheumatic Pills (Knoll).—Iodoform, reduced iron, each 3 grammes ($46\frac{1}{2}$ grs.); purified liquorice juice, enough to make sixty pills, to be sprinkled with lycopodium. Two to be taken three times daily.

Anti-rheumatic Pills (Purdon).—Iodoform $2\frac{1}{2}$ grammes, reduced iron 1 gramme; liquorice juice, 4 grammes; water enough to make fifty pills. Two or three to be taken every two or three hours in neuralgia or rheumatic affections.

Iodoform Pills.—Iodoform, extract of gentian, of each 5 grammes; gentian root (powder) sufficient to make 100 pills. From three to five to be taken twice or thrice daily in scrofula, amenorrhœa, and cancer.

Ethereal Solution of Iodoform (Gubler).—Iodoform, 2 parts; dissolved in spirits of wine, ether in each 4 parts. To be painted over the painful parts in chronic arthritis, with a camel hair pencil, the part to be afterwards covered with oil silk.

Anti-hæmorrhoidal Suppositories (Hillairet and Purdon).—Iodoform, $2\frac{1}{2}$ grammes; cacao oil, 40 grammes; yellow wax, 5 grammes. Mix at a gentle heat, and make 10 suppositories.

Iodoform Ointment.—Iodoform 5 parts; hog's lard 45 parts; to be melted together at the temperature of a water-bath and stirred until cool. To be marked "For external use." In pruritus, prurigo, chronic eczema, fissures, and painful ulcers. (*London Medical Record*, Oct. 5th 1878.)

The Liver in Phosphorus Poisoning.—Weyl, in a paper published in the *Archiv. der Heilkunde* has given an account of some experimental researches on the changes in the liver in phosphorus poisoning. He confirms the statements of other observers that unless the degeneration is very acute, there is also an interstitial proliferation, especially in the portal canals. Its occurrence seems to depend on the chronicity of the process. In two cases in which death occurred respectively twenty-four hours, and five days, after phosphorus had been given by the mouth, he failed to find this proliferation, but it was present in a case in which the animal lived four weeks. In the two former cases, however, the interstitial tissue was fatty. Further investigations were directed to the origin of the fat which is found so abundantly within the liver-cells in acute phosphorus poisoning, whether it arises by fatty infiltration or by fatty metamorphosis. He assumes that the latter must present as its earliest stage granular cloudiness and swelling, and as this was found in no case, but always accumulation of fat in transparent cells with distinct nuclei, he concludes that the process is one of infiltration. He believes that the phosphorus de-

composes the circulating albumen in the blood, as well as the formed albumen in the cells; so that we have, on the one hand, large quantities of fat formed partly in the blood and partly in the liver and deposited there, and, on the other, lowly oxidised substances partly nitrogenised, partly non-nitrogenous, as leucin tyrosin, lactic acid and urea. It will be observed however, that the inference from these observations rests on the assumption that the absence of a stage of cloudy swelling excludes the origin of the fat within the cells, an assumption not quite justifiable. (*Lancet*, Oct. 19, 1878.)

Tobacco Amaurosis and Similar Conditions.—Mr. J. Hirschberg is in favour of the existence of tobacco amaurosis; a distinctly marked paracentric scotoma or dimness is developed causing characteristic bilateral disturbance of vision. It incloses the fixed point, and extends in an oval form as far as, or even over Mariotte's spot. The scotoma for white is always relative, never absolute; the scotoma sinks therefore to $\frac{1}{3}$, $\frac{1}{6}$, $\frac{1}{25}$, and $\frac{1}{30}$ below the normal, without any appearance of amaurosis. In bad cases green is not visible in the scotoma, and finally also blue. The pupil appears healthy at first, but afterwards presents a slight discolouration in the maculous half. In typical cases of alcohol amaurosis, on the contrary, the scotoma is pericentric, and the fixed point therefore does not represent the mathematical centre of the indistinctness of vision. Within the scotoma red and green both disappear. (*Deutsche Zeitschr. f. Pract. Med.* 1878.)

Elephantiasis of the Eyelid.—Mr. A. Ph. Beck, of Basel, has under the direction of Schiess-Gemuesus been investigating that pathological condition of the eyelid described as elephantiasis. In the two cases on which his experiments were made it was found that the greatest enlargement had taken place in the connective tissue, in the cutis, behind the orbicular muscle, and in the meibomian glands as far as the mucous membrane of the conjunctiva. There was enormous dilatation of the lymph spaces, the arteries and veins being hyperplastic rather than hypertrophied; the muscles were enlarged, and in one case had undergone amyloid degeneration. The smallest increase of size was observed in the epidermal formations. There were no sweat glands present; and on several epidermal formations there was amyloid degeneration. (*Centralblatt f. d. Med. Wiss.* No. 38, 1878.)

On the Relation between Cardiac Hypertrophy and Renal Disease.—Dr. Senator of Berlin (*Virchow's Archiv*, Band. lxxiii., Heft 3), discusses this question at some length. He considers where no obvious mechanical cause of cardiac hyper-

trophy exists, the explanation is to be found in the state of the blood in chronic parenchymatous nephritis, and in the state of the terminal arterioles in chronic interstitial nephritis; in the latter it often happens that hypertrophy exists without dilatation, or even with narrowing of the cavity of the ventricle; these cases he regards as idiopathic primary hypertrophy, as he says hypertrophy consequent upon obstruction, or difficulty in discharging the contents of the ventricle, must be associated with dilatation. The cause of this idiopathic hypertrophy may be nervous, as in Basedow's disease, or more probably it may be due to some state of the blood. The high tension in the aorta is due to the state of the terminal arterioles. He leans to Gull and Sutton's theory and believes that the kidney-affection is a consequence or concomitant of the general disease. (*London Medical Record*, Oct. 15, 1878.)

Treatment of Chronic Catarrh of the Stomach.—Dr. Neftel, of New York, has had occasion during the last ten years to treat a considerable number of patients suffering from this form of dyspepsia. In the majority of cases there was great anæmia and emaciation; general prostration and inability to work intellectually; loss of memory, dimness of vision, and occasionally tinnitus aurium and frequent fainting. The patients complained of vertigo, always felt chilly, and had a constant uneasy feeling in the epigastrium. This uneasiness increased to intense pain several times in the twenty-four hours, especially during the night. They had frequent eructations, nausea, and sometimes vomiting, and complained of complete want of appetite. The bowels were costive, pulse small, heart's action feeble, respiration slow, the temperature not increased: the skin pale and dry, the abdomen tender and distended in the epigastrium. On examination it was found that fermentation was going on in the stomach of such patients, acetic, lactic, and butyric acids being found in the vomited material. Dr. Neftel in treating cases of chronic gastric catarrh, arrests the fermentative changes which take place in the stomach by administering chlorine, thymol, salicylic acid, hydrochloric acid, and other anti-fermentatives. He treats the dilatation of the stomach (gastrectasia) and the atonic condition of the bowels with induced currents; whilst he excites the secretion of a healthy gastric juice by the use of alkaline waters, small doses of rhubarb, bitter remedies, &c., and improves the digestive properties of the gastric juice by the administration of hydrochloric acid, not only in dyspeptics, but also in anæmic persons generally, in those affected with fevers, and in convalescents. Dr. Neftel also recommends that persons suffering from chronic gastric catarrh should have a simple and easy digestible diet which

must not be too uniform, whilst pure water should be given in abundance. (*New York Medical Record*, June 8, 1878.)

An Early Symptom of Tabes Dorsalis.—If a sharp blow be struck upon the ligamentum patellæ in an individual whose leg is pendent and half flexed, the limb is sharply raised owing to a reflex contraction of the triceps cruris. This reflex action is known as the “knee phenomenon.” Prof. Westphal has noticed that this action does not occur in patients who are about to suffer from locomotor ataxy. Prof. Westphal lays special stress upon the absence of the lesser phenomenon as being an important sign in diagnosis, at a time when the characteristic symptoms of tabes have not developed themselves. During the initial period, which is sometimes of considerable length, locomotor ataxy can only be diagnosed by pains which do not always assume the fulgurant type. Prof. Westphal has also observed a case of locomotor ataxy, in which the symptoms were diplopia with numbness of the fingers on both sides, whilst there was absence of the knee phenomenon. This negative characteristic could be made use of equally well, in a case of amaurosis occurring without known cause and by itself, to decide whether it was of spinal origin, and was to be considered as an initial symptom of locomotor ataxy. Conversely, the lower limbs may be the seat of motor inco-ordination without this phenomenon being absent, as would occur at the commencement of certain acute febrile attacks. The persistence of the reflex action in the tendons in this case indicates that it is not due to the ordinary lesions of locomotor ataxy, and that if there is degeneration of the posterior chords, it has not reached the lumbar position of these organs. This symptom, therefore, mentioned by Westphal, is of great value in diagnosis. It must not however be forgotten that the knee phenomena may occasionally depend upon other causes than locomotor ataxy, as for instance upon varieties of spinal paralysis with loss of irritability of the muscles. (*Berlin Klin. Wochenschr.*, 1, 1878.)

Cercomonas Intestinalis and Diarrhœa.—Prof. Zunker has found this infusorian in the stools of several patients suffering from diarrhœa. The stools were of a yellowish brown colour, foetid smell, semi-fluid consistency, and very viscid owing to the presence of a large number of small masses of mucus. In these portions of mucus the cercomonas intestinalis was commonly found in great quantities. There are two varieties, one almond-shaped, containing isolated granules in its interior, as well as vesicular formations. The pointed extremity terminates in the shape of a dart, whilst the anterior end is furnished with cilia. The second variety has an oval and rather long body, terminating in a sharp point, having a long vibratile cilium at

the anterior extremity; a vesicular nucleus is constantly present. In fresh stools the movement is well marked; but the monads soon die. The addition of weak acids accelerates the movement. The increase of the diarrhœa which is coincident with the increased number of the infusoria, and the improvement which follows upon their disappearance, seem to indicate a causal relationship between the cercomonas and the diarrhœa. The infrequent appearance of the organism is probably due to certain nutritive conditions in the intestine which are as yet ill defined. Relying on the favourable result of his treatment, Prof. Zunker supposes that the lower portion of the alimentary tract is the chief seat of the infusoria. He proposes, therefore, as a certain means of getting rid of the cercomonas and the diarrhœa which it causes, to inject large quantities of water into the intestines with the addition of 0.02—0.3 of sublimate. He finds that the addition of quinine or carbolic acid is useless. (*Centralblatt. f. Med. Wiss.*, 1878, p. 347.)

Pause of the Pulse in Intrathoracic Aneurism and in Aortic Insufficiency.—M. Franck offers as signs of diagnostic value in cases of intrathoracic aneurisms the following observations. In aneurism of the ascending portion of the aorta, inequality of the amplitude of the radial pulse on the two sides is very frequent. On taking into account the pause of the pulse it is found that it is increased on both sides in cases of aneurism of the ascending portion of the aortic arch, whilst it occurs only on the right side in aneurism of the brachio-cephalic trunk. The existence of an increased pause in the radial pulse therefore excludes at once aneurism of the aorta from the diagnosis, but allows of either aneurism of the brachio-cephalic trunk, or of the thoracic portion of the subclavian. To establish the diagnosis Dr. Franck ascertains whether the increased pause can be observed in the right carotid and the right radial; if this be the case the aneurism is in the brachio-cephalic trunk. If however the increased pause is not perceptible in the arteries which supply the upper limb, the aneurism is in the deep portion of the subclavian, and the carotid pulse preserves its normal pause at the beginning of the cardiac systole. In cases of aortic inefficiency, the author has ascertained that instead of finding an increased pause in the carotid pulse, as M. Tripièr of Lyons has asserted, there is in reality a pause of less duration than is ordinarily the case. The apparent increase of the pause is due to the illusion of touch, in which the shock at the commencement of the diastole is taken to represent that of the systole, owing to the large reflux of blood which occurs. It is therefore necessary to compare the beat of the heart simultaneously with the carotid pulse. The explanation lies of course in cases of

insufficiency of the aorta, in the fact that the arterial pressure is markedly lowered, and the propulsive power of the left ventricle increased: two conditions which favour the passage of an undulatory wave, whilst they diminish the pause of the pulse. (*Compt. Rendus. Ac. Sc. t. lxxxvii.*, p. 296.)

On the Treatment of Colic.—Dr. D. L. Phares, in the *Transactions of the Mississippi State Medical Association*, 1878, directs attention to the mechanical treatment of colic. This consists in simply supporting the patient in an inverted position—in other words, in standing him on his head. In some instances, cases that have for hours or days resisted all ordinary treatment, have by this simple means been relieved and permanently cured in from one to five minutes. Cases attended with most intense pain, vomiting and other phenomena of so-called “bilious colic,” have been thus cured. Relief is sometimes obtained by the knee breast position, or by suspending the body by means of the thighs and legs extended across a high bed or table, the arms and hands being free to assist in giving support to the head. But complete inversion is the most sure and prompt remedy. The majority of cases of colic result from mechanical influences, and it is but reasonable to seek relief in mechanical counter-influences. Several very distressing cases are remembered as being instantly cured in the inverted position, solely, as the patient averred, by the escape *per anum* of a single small bubble of gas, without explosive noise. Other cases of most agonizing character have been instantly and permanently cured by a change of position of gas in the bowel, effected so quickly as barely to be noticed by the patient. Often the pain vanishes the instant the vertical position is assumed, and does not return so long as this posture is maintained. But relief is not usually permanent unless some movement of gas be felt. Such movement may be perceived by the patient very promptly, or one minute or more may elapse; rarely no movement at all is perceptible, and yet the relief may be complete. This treatment is not presented as infallible in all cases; from the very nature of the obstructions it is reasonable to expect some failures. (*London Medical Record*, Oct. 15, 1878.)

Investigations on the Absorption of Chromium in the Blood after the external application of Chromic Acid.—Dr. Mayer, after the use of chromic acid as a caustic in gynaecology, has observed that in many cases vomiting, diarrhoea, and appearances of collapse presented themselves. Mosetig was the first to show, in the account of a fatal case which he published, that there was a distinct absorption of the caustic from the wound. He deduced this fact from the appearances of intoxication which presented themselves previous to death.

Gergens injected chromic acid into dogs, and drew the conclusion that it was absorbed from the nephritis which he observed to occur after the injection. The author, who has set himself to confirm this hypothesis, has determined qualitatively the presence of chromic acid in the blood, and quantitatively its presence in the liver, heart, and kidneys. (*Medicinische Jahrbuch*, 1877, S. 139.)

The Temperature in Croup.—Dr. Löb, of Worms, gives a digest of the various opinions which are held as to the temperature in croup. This temperature is always above the normal during the disease, but the rise is sometimes of greater, sometimes of less extent. Dr. Löb cites a case of diphtheritic croup, in which the temperature in the rectum during the whole course of the disease never exceeded $38.5^{\circ}\text{C.} = 101.3^{\circ}\text{F.}$ In two cases of ordinary croup there was entire absence of all febrile symptoms. In a girl of eight years of age, on the other hand, suffering from catarrhal laryngitis, the temperature in the axilla rose to $39.5^{\circ}\text{C.} = 103.1^{\circ}\text{F.}$ The conclusion at which the author therefore arrives is that the temperature does not afford a safe guide in diagnosing common diphtheritic from catarrhal laryngitic disease. (*Jahrb. f. Kinderheilk.* xii. bd. i. and ii.)

On Xeroderma.—Dr. Lewinson thinks that it is necessary to divide xeroderma into two forms, a symptomatic and an idiopathic. In this manner he proposes to render the nomenclature of the disease more uniform, and to enable it to be described apart from other diseases which similarly involve dryness of the skin. In a case of marked xeroderma (archidrosis) which came under the author's notice, the failure of function on the part of the sweat glands in the part affected was clearly demonstrated. The patient was treated with hypodermic injections of five milligram doses of pilocarpin muriaticum, and other diaphoretics, which caused copious perspiration, the xerodermic parts alone showing no trace of any secretion of sweat. (*Centralblatt f. Med. Wiss.*, October 19, 1878.)

Treatment of Constriction of the Larynx.—Mr. L. von Schroetter has given an account of four cases of constriction of the larynx which he has successfully treated. The first, on which tracheotomy was performed on account of laryngeal perichondritis, came under treatment about six weeks after the operation. The canula could be removed after six months, and after nine months all measures for enlarging the larynx were discontinued, the patient being completely cured. His organs of speech were fully restored, so that he could resume his former occupation of teacher of elocution. In the second patient a cure was accomplished in the course of a year. A third patient for

half a year under treatment is nearly cured, having now an occluded canula. Tracheotomy was performed for perichondritis, the result of typhus. Another case of constriction after small-pox did not require tracheotomy; it was successfully cured in five months by the introduction of bougies. The manner in which the treatment is effected has been repeatedly described by Schroetter. In cases of tracheotomy tin bougies are used and indiarubber tubes. (*Wiener Med. Blätter*, No. 3 and 4, 1878.)

Spasm of Ætiology of the Glottis.—Dr. Oppenheimer has come to the following conclusion, from an examination of clinical observations, and from the experiments of Rosenthal, in relation to spasm of the glottis. Spasm of the glottis in children is due to stimulation of the centripetal or motor fibres of the pneumogastric nerve. The excitation is caused by pressure of the dilated jugular vein in the jugular foramen, arising from undue yielding of the intra-jugular ligament, caused by rachitis. Dr. Oppenheimer therefore proposes that the name *Asthma rachiticum* should be given to the disease. (*Centralblatt f. Med. Wiss.*, October 19, 1878.)

Ergot in Trichina.—D. Rohde relates in the *Berliner Klin. Woch.* a case of trichinosis, in which severe bleeding of the nose occurred, and in which he prescribed extract of secale cornutum as a styptic. The hæmorrhage was immediately arrested, and with this rapid improvement of the general symptoms also occurred. This result led him to prescribe ergot in other cases of the disease, and in all instances distinct improvement followed. He believes, therefore, that we have, perhaps, in ergotin a means of treatment which, without any marked effect on the human economy, may prove fatal to trichinæ and their offspring. (*Edinburgh Medical Journal*, November, 1878.)

Constriction of the Larynx after Typhoid Fever.—Dr. Koch reports the case of a young man, who, during the second week of pronounced typhus, with the usual hoarse voice, croupous cough, and increasing dyspnœa, showed symptoms diagnosed as laryngo-typhus. There was no difficulty in swallowing, no swelling of the throat-glands, no parotitis, no purulent or bloody expectoration, nor were any cartilaginous matters thrown up. As far as could be discovered by palpation, the cartilage remained intact; there was nothing abnormal in the pharynx, nor in the external epithelium; none of the usual painfulness was felt. When the disease had run its usual course, and the patient was cured in two months, the laryngeal symptoms increased to such an extent that about twelve months after the fever tracheotomy had to be performed. By means of the

laryngoscope Dr. Koch ascertained the following facts: the epiglottis was thickened over the whole surface, almost immovable, rounded and curved inwards at the edges, and having a deep incision in the middle part. There was no ulceration visible; the anterior third of the congested vocal chords came in contact with the other two thirds, and formed a triangle, with a base of scarcely 2—3 millimeters, which triangle represented the glottis. The vocal chords were immovable during phonation, scarcely approaching each other during inspiration, or separating during expiration. The general health of the patient was nevertheless satisfactory; the cough was hoarse and violent, though there was only a small amount of catarrhal sputa; inspiration was troublesome, and made with a hissing noise; expiration was somewhat easier. The palpation of the larynx led Dr. Koch to believe that the cartilage was unimpaired. After tracheotomy, Schrötter's tin bougies were introduced, and No. 17 (the size of an ordinary throat) was admitted without difficulty. For a year afterwards the patient was not under treatment, but then he appeared in the same state, with the exception of redness at the head of the throat.

Dr. Koch came to the conclusion that there was ankylosis of the dry cartilage after ulcerations of the larynx; these ulcerations had healed long before without leaving any cicatrix. The reasons for this diagnosis were founded on the position and immovability of the vocal-chords, and the unsuccessful result of the dilatation with the bougies, on the one hand, and the early appearance of the disease, and the non-appearance of all cicatrices on the other hand. (*Ann. des maladies de l'oreille du larynx, etc.*, p. 63, 1878.)

Action of Iodoform.—Dr. Sigmund, of Vienna, has used iodoform with very successful results in ulceration and indurative processes, glandular swellings, rhagades, and gummata. He employed the following formulæ: iodoform and spirit each 1 part; glycerine, 5 parts, or 1 part of iodoform in 3 or 4 of sugar; or 1 of iodoform in 5 of vaseline; or iodoform collodion, 1 in 10, or 1 in 15. The pain was unimportant; the surfaces of the sores became clean in from twenty-four to forty-eight hours, and granulated favourably. The offensive smell of diphtheritic and cancerous ulcerations was entirely removed by the remedy. Dry iodoform in powder applied to fresh wounds forms a uniform firmly adherent paste. (*Deutsche Med. Wochenschr.*, Aug. 10. *Edinburgh Medical Journal*, Nov., 1878.)

Notes and Queries.

PEPTOCOLOS, OR COMPOUND PEPSINE WINE.—Messrs. Richardson and Co., of Leicester, have sent us a preparation bearing this name. It consists simply of pepsine wine with the addition of pancreatine, lactic, and hydrochloric acids. Like ordinary pepsine wine, it has little digestive action upon meat, and therein differs from pepsine powders; but it coagulates milk readily, and also readily digests starch. While, therefore, it cannot take the place of pepsine powder in the case of adults suffering from inability to digest meat, it may be used in cases where there is deficient power to digest farinaceous food, and it is likely to prove a very useful preparation in the treatment of indigestion in infants.

HYPNOPOIETIC.—This preparation is also made by Messrs. Richardson. It is a solution of opium of the same strength as the tincture of opium of the British Pharmacopœia. The manufacturers claim for it that it does not produce headache, stupor, or constipation, and that it may be given in those cases of idiosyncrasy where the usual preparations of opium are inadmissible. We have delayed noticing this preparation because we wished to try it in such cases, but no opportunity has yet presented itself to us. We have, however, tried it in cases where no idiosyncrasy existed, and have found that in those cases at least the patient awoke next morning without any headache or gastric disturbance whatever, and we think it not unlikely that it may prove, in cases where idiosyncrasy really exists, to possess those qualities which are claimed for it.

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* * Any of the foreign works may be procured on application to Messrs. DULAU, of Soho Square, W.C.; WILLIAMS and NORGATE, of Henrietta Street, Covent Garden, W.C.; or BALLIÈRE, of King William Street, Charing Cross.

Department of Public Health.

NEW WARDS (FOR INFECTIOUS DISEASES) JUST ERECTED AT STAMFORD, LINCOLNSHIRE.

BY WILLIAM NEWMAN, M.D. LOND., F.R.C.S. ENG.

UNTIL a comparatively very recent date, it would seem that the designers and builders of hospitals were satisfied to take as their model the plan of an ordinary dwelling-house; giving additional bedroom accommodation to meet the increased number of inmates, and making the easy working of the administration, together with the personal comfort of the permanent residents, matters of paramount importance; yet, in the so doing, unhappily neglecting the main object of the erection, the care and well-being of the sick.

Far too many of the older hospitals, and not a few even of the more recent ones, exhibit faults of this character: The atmosphere of the whole building is common property, open to contamination alike by the exhalations from the bodies of the invalid occupants, the preparation of food, the odours from ill-placed sanitary arrangements, and from any other, however undesirable, source of extraneous pollution.

One word, "isolation," should be constantly borne in mind as a *sine quâ non* in all buildings devoted to the sick: not that every case should have its separate apartment, but that such provisions should be made as to place in the hands of the medical staff the power, to be used at will and as need may arise, of effectively and thoroughly isolating any given case or series of cases.

True as I would maintain this axiom to be in reference to *all* erections for the cure of disease, it is especially valid in the instance of wards devoted to the reception of infectious ailments.

The following description of some detached buildings recently constructed at Stamford may not be without interest:—

The Stamford Infirmary has been in existence fifty years. It contains under one roof the necessary accommodation for between thirty and forty patients and the resident staff, and is not without some of the blots and inconveniences which are inseparable from “composite” hospitals.

The new wards are situated east of the older building, a space of from forty to fifty yards intervening between them. Three blocks of two stories each afford on each floor accommodation for *five* patients and a nurse; these blocks are practically uniform in arrangement, the central block differing, however, somewhat in external appearance and in the internal plan from the other two; a distance of from seven to ten yards exists between the several blocks.

Behind these structures is an open space, fifty yards deep, left purposely for the erection at some future time, if it be found desirable, of a kitchen, or other offices. At the further end of this space is placed a low one-storied building, containing the appliances for a laundry and disinfecting chamber, while in the rear of this again is the dead-house, also quite detached.

To go more into details: especial care was taken to cover all the inclosed area with a layer of Portland cement concrete, six inches thick, so as to prevent the ascent of damp from the subjacent porous oolitic strata. A damp-proof course was also provided at the base of the walls.

The buildings are of the local stone of the district, oolitic, of varying density. The quoins, jambs, and window-beads are of Casterton stone, the window-sills and plinths of Clipsham limestone.

Each block, to speak of one for all, has two stories above the ground-level, and in the basement more or less of cellar room, for storage of coal, &c. Each story is thus arranged:—There is an entrance lobby, having on one side the stone staircase, and on the other side a nurse’s room, while between the two is placed the door of the ward, which, with its appendages, occupies the remaining space.

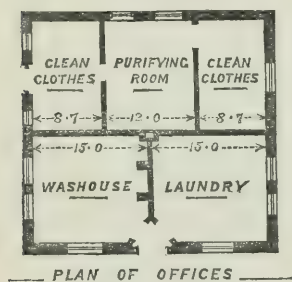
The ward is twenty-five feet square, with a height of fifteen

feet, and is arranged to receive *five* patients: the air-space for each bed therefore being over 1,800 cubic feet. The walls are lined with glazed bricks throughout, built in as the work proceeded, and jointed in Parian cement with the purpose of making the walls impermeable and absolutely non-retentive of organic matters.

The windows are placed on the three outer sides of the ward; two, smaller in size, face the door of entrance, while the larger windows on the right and left hand respectively are directly opposite to each other. In their lower two-thirds the windows are of the ordinary sash-pattern, while the upper third is occupied by a framed casement, which is hinged at the bottom and

falls inwards at pleasure. This arrangement has been adopted in all the windows.

Each ward has a bath-room and water-closet, opening, with the intervention of a cross-ventilated lobby, from the corners most distant from the entrance door. This description applies to the two end blocks only; in

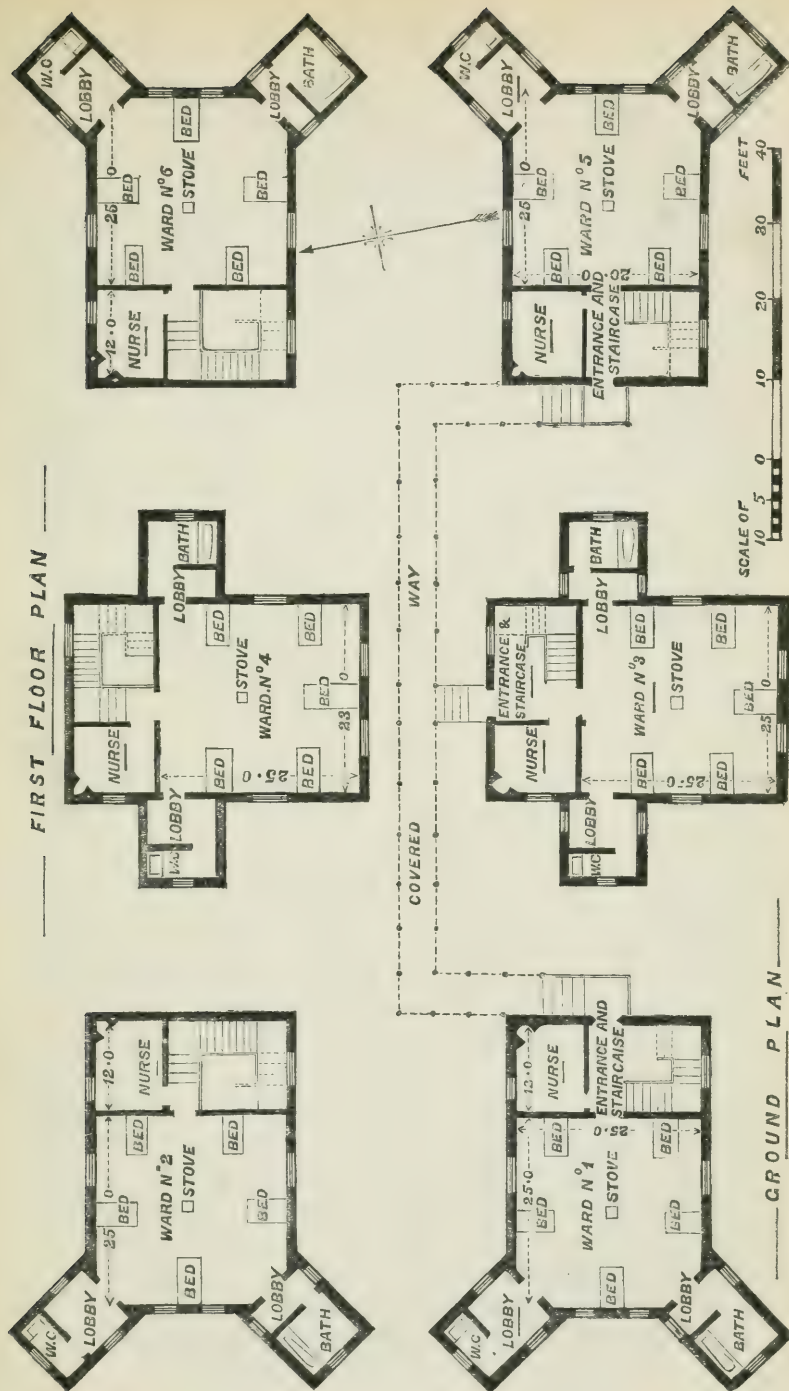


the central structure the bath-room and water-closet are on the right and left of the entrance door in the corners of the return walls. These additions are lined with Parian cement; the staircase, nurse's room, &c., with ordinary plaster.

Four rectangular metal ventilating shafts for the supply of fresh air are fitted in each ward, opening below the floor level to the external air, and ending within the ward about five feet above the floor.

A central stove on Galton's pattern is placed in the ward; to this fresh air is brought by special wide channels from the outside, and this air, warmed in its passage, is delivered into the room through perforated openings above the stove, three feet from the floor. The smoke-flue is continued straight upwards to the open air, running within a square framing of metal-work covered with tiles: not quite one half of the sectional area of this framing is, however, occupied by the smoke-flues; the remaining portion is so contrived as to form a ventilating shaft

FIRST FLOOR PLAN



GROUND PLAN

for the two wards, extracting by special gratings the foul and heated air close under the ceiling, and then delivering it through openings of proportionate size placed on the sides of the chimney some distance above the roof.

The entrances and the nurses' rooms are paved with hard, well-burned red and black Staffordshire tiles; the ward floor is of hard pitch pine, long dried before use, and closely joined by grooved and tongued joints; it is intended, by coating of paraffin or varnish, to make these floors impermeable to moisture. Under all these wooden floors there is provision for the free circulation of air between the concrete below and the joists above.

The whole of the internal woodwork has been so arranged that there are no mouldings or projections round the doors or windows; no facilities, in short, for the collection of dust. The woodwork again internally is all varnished, not painted.

The glazed linings of the ward have been thus planned:—Next the floor are placed two courses of black bricks; then a dado, about four feet high, of cream-coloured bricks, finished above by a single band of chocolate colour; from this darker line to the ceiling the wall is covered with bricks of greyish white. To break the uniformity and coldness of this colour, three tile pictures (three feet by two feet) have been placed, one on the inner face of each external wall. These pictures illustrate in each instance some agricultural or outdoor occupation, and are let in flush with the inner surface of the wall itself.

In the lobby of the bath-room is fitted a plain slate lavatory. The baths in most of the wards will be on wheels, so as to allow of easy movement to the bedside of any inmate.

The closets are throughout on Jennings' trapless pattern; they open directly without syphon or bend into an earthenware soil-pipe, constructed of jointed lengths of glazed sanitary pipes, specially made for the purpose. The upper end of the soil-pipe, open to the external air, is guarded by a Feild's cowl, and the channel, fixed to the outside of the wall, discharges below into a main sewer, with the intervention, close outside the wall, of a Potts' Edinburgh trap.

All the waste-pipes from closets, cisterns, or baths, from sinks in the nurse's room, or lavatories, are so constructed as to

ensure perfect disconnection; in each instance they are carried through the outer walls, run down the outside, and open upon hollowed stones a foot or more distant from a trapped iron grating lying upon the ground-level: sewer gas, if it should regurgitate through the traps, cannot therefore ascend through these pipes into the building.

The branches of sewer from each closet, bath-room, and surface-trap are collected into one large channel, which leads down to a closed and well-ventilated cesspool. This is fitted with convenient arrangement on the ground-level for such frequent emptying as may be desired. In the line of the main sewer, 140 yards in length, there are two or more apertures for the escape of sewer gas.

The disinfecting apparatus will be, in all probability, that suggested by Dr. Ransom of Nottingham.

The whole arrangements have been carefully worked out by Mr. Browning, the architect, of Stamford. The exterior is extremely plain, with no elaborate ornamentation, and the internal arrangements at least allow the hope that perfect isolation, with every convenience for the sick inmates, will have been attained.

HOSPITAL CONSTRUCTION: CIRCULAR WARDS.

JUST as we had settled down in the comfortable belief that the possibilities of sound hospital arrangement and construction had been exhausted, and we were waiting patiently for the beginning of the hospital millennium in the building and completion of the Johns Hopkins Hospital, Baltimore, Professor Marshall steps in and stirs further debate.¹ Mr. Marshall's appearance in this polemic would appear to have been determined by certain discussions as to the rebuilding of the hospital to which he is attached, and the difficulties attending the planning of a sufficiently capacious hospital according to modern principles of ward construction on the too contracted site. Dealing with

¹ *On a Circular System of Hospital Wards*, by John Marshall, F.R.S., &c., Professor of Surgery in University College, and Senior Surgeon to University College Hospital, London; with remarks and illustrations by Percival Gordon Smith, Associate of the Royal Institute of British Architects, &c. London: Smith, Elder, and Co., 8vo. pp. 22, 1878.

this question, it seems to have occurred to Professor Marshall that the substitution of circular for oblong wards would obviate serious difficulties in arrangement of blocks of buildings and in ward lighting and ventilation, besides giving certain positive advantages in the capacity and administration of wards. Further consideration appears to have suggested to him that a circular system of wards presented advantages as compared with oblong wards worthy of more general attention than the particular circumstances out of which the suggestion arose; and accordingly he submitted a paper on the *General Principles of a Circular Ward System* to the recent meeting of the Natural Association for the Promotion of Social Science at Cheltenham, together with sundry observations on the structural questions which such a system involves, by Mr. P. Gordon Smith, who is the Architect to the Local Government Board. Both papers are now given to the world in pamphlet form, with diagrammatic illustrations indicative of the adaptability of the system.

The unhesitating, vivacious disfavour with which Mr. Marshall's suggestions were (if we may credit newspaper reports) received in the discussion which followed the reading of the paper at Cheltenham, was significant rather of the unpleasant shock given to comfortably settled convictions as to hospital arrangements than to a thoughtful examination of the suggestions themselves. Indeed, the notion of a circular ward rolled suddenly amidst the audience of the Public Health section of the Association, appeared to exercise much the same sort of effect upon the minds of the listeners as a skittle-ball rolled among their legs would have done upon their actions. The notion deserves, however—particularly from the deserved respect due to its author and his coadjutor—a more careful consideration than at the instant of its presentation could be given to it.

With regard to the medico-sanitary "pretensions" (the author's word) of circular wards, we follow Professor Marshall's own statement:—

"(a) As regards *freedom of frontage* to all quarters of the compass, a circular ward would be uniformly free, except at some small part connecting it, by means of an open, or partially open, corridor with other circular wards, or with the necessary offices and administrative buildings.

“(b) As regards the access of *light* and *air*, a circular ward cannot be surpassed. It is strongly insisted on by Professor Jones (Billings' Reports), that ‘an unlimited supply of air’ to a ward ‘is the *cardinal* consideration’; and, again, it is elsewhere stated (Oppert), that ‘the worst wards are those where least air and light are provided,’ and that ‘a closed court with wards [around it is the worst arrangement.’ A circular ward is obviously the inverse of this last-named plan; and, moreover, having no blank ends like an oblong ward, its uniformly rounded exterior, receding from all adjacent buildings, would receive light, air, and wind from every direction.

“(c) The amount of *wall space*, *floor space*, and *cubic space*, for each patient, in a ward of any shape, may of course be regulated by adapting the number of beds to the dimensions of any given ward; but it will be found that a circular ward, unless it be a small one, offers decided advantages in each of these respects. To illustrate this, I will take, as an example, a ward circular in shape, and having an internal diameter of 61 feet. Such a ward would give $191\frac{1}{2}$ linear feet of internal wall surface, which would afford 8 feet of wall space for each of twenty-four beds, and $9\frac{1}{2}$ feet for each of twenty beds. To obtain space for access to the ward, however, two beds must in either case be deducted, so that the accommodation would be reduced to twenty-two or to eighteen beds. Nevertheless, as regards available wall surface the circular ward has the advantage; for to accommodate twenty-two beds in a parallelogram 30 feet in width, giving to each bed a wall space of 8 feet, would require 236 feet run of wall; whilst for eighteen beds, with $9\frac{1}{2}$ feet of wall space to each, 231 feet of wall would be required, instead of $191\frac{1}{2}$ feet, as in the proposed circular ward. This is explained by there being no available places for beds at the ends of an oblong ward.

“The total *floor space* in a circular ward 61 feet in diameter is 2,922 square feet, and this of course exceeds the space capable of being inclosed by an equal run of boundary wall arranged in any other regular or irregular figure. It would yield, for twenty-two beds, about 133 square feet of floor space for each, and for eighteen beds, 162 superficial feet for each. The floor space per bed in any oblong pavilion ward 30 feet wide, in which a wall space of 8 feet is allowed for each bed, is only 120 feet; so that the advantage of the circle is clearly obvious. A few years since, 84 superficial feet were regarded as an ample allowance for each bed; but according to Stephen Smith (Billings' Reports), 120 square feet are now demanded, and for certain special hospitals a still larger space is desirable. The circular ward system affords the most economical mode of securing such a space, so far as linear extent of wall is concerned.

“The amount of *cubical air space* for each patient necessarily follows the same rule, and would be relatively greater in the circular than in the oblong ward here supposed. Thus, the oblong ward, with 120 square feet to each bed, would give 1,800 cubic feet per patient, for a height of 15 feet; whilst the circular ward would afford, with the same height, either 1,995 cubic feet for each of twenty-two patients, or 2,443 cubic feet for each of eighteen patients. In special hospitals, any required amount of cubical air space could of course be obtained either by an increase of height beyond 15 feet, or by diminishing the number of beds. In reference to the last point, it may here be observed that all authorities agree that the number of patients in a pavilion ward should never exceed thirty. Stephen Smith (Billings' Reports) would restrict the number to twenty. The alternative numbers proposed in the above-described circular ward are eighteen or twenty-two.

“(d) In reference to *ventilation*, I venture to suggest that a circular ward would offer highly favourable conditions for the complete attainment of this ‘cardinal consideration.’ In contact with the air on all sides, save for about one-twentieth

part of its circumference, where it would be united with its corridor or offices, and having its windows disposed at regular intervals around it, it would form a sort of facsimile of the *circular tent*, so efficaciously sanitary, because so completely detached and aerated. Horizontal currents of air would sweep more readily and uniformly around the external surface of a circular than an oblong building. For the purpose of *natural ventilation*, every such horizontal movement of the outer air would become available, from whatsoever quarter or side it came. Proper openings systematically arranged in windows or walls, and acting as inlets or outlets as the case may be, would admit air or allow it to escape on every side, the fresh air being conducted beneath, above, or between the beds. For *artificial ventilation*, a shaft or shafts would find a suitable place in the centre of the ward, and therefore equidistant from the circumferential inlets; such shafts might be easily and conveniently made to work by some central heating apparatus, or by some central mechanical agency. The difficulties attendant upon ventilating a long ward would disappear. Sharp draughts across the ward, down draughts on the walls opposite and relatively near to open windows, deficiency of movement of the air with certain winds, and the unequal or opposing extracting power of two or more fireplaces would not exist.

"It may also here be mentioned that the large central area of a circular ward would serve to separate patients very widely from their opposite fellow-sufferers. In an oblong ward, 30 feet wide, the distance from the foot of one bed to that of the bed opposite to it is 18 feet; in a circular ward 61 feet in diameter it would be 48 feet. In the former case, the mean distance of the middle beds from the remainder is about 26 feet; in the latter, the mean distance of any one bed from the rest is 32 feet. The quantity of air between the patients would of course be greater.

"(c) As to the equable *warming* of a circular ward, it is obvious that a central source or sources of radiating heat would present the advantage of being equally distant from every patient in bed; the warming centre would be in reality a *focus*; and, moreover, such a disposition of the heating apparatus would facilitate the central movement of the air for the purpose of artificial ventilation. But probably, warm water pipes would have to be introduced around the circumference of the ward, a matter of as little difficulty as in an oblong ward.

"(f) The *isolation* of circular wards from each other, on the horizontal plane, would be accomplished readily by long and narrow connecting corridors, exposed to the air on both sides, and open or closed, as might be preferred in particular cases. The number and the mode of connection of the circular wards themselves would also vary in different instances.

"(g) The number of circular wards placed one above the other might likewise be varied. One floor only would be preferable for fever hospitals, for example, or in situations where ground space was of no consideration. But in towns, or on limited areas, two, or at the most three, floors should be the limit. If three such circular wards as I have described were placed one above the other, a *circular Ward Tower* would be formed, containing either sixty-six or only fifty-four patients *under one roof*. I would prefer the smaller number. The severest standard (Billings' Reports) admits eighty or a hundred as the maximum allowable number under one roof, according to the nature of the cases admitted. The superimposed wards might be without *direct* staircase communication with each other, and might have such communication secured *indirectly* from the connecting corridors. The *basement* of such a circular ward might, of course, be constructed on dry arches—a point regarded of great importance by many—or, if partially used for dry and clean stores, might be intersected by wide and well ventilated

passages; it would furnish suitable space for heating apparatus of any kind. On the *circular roof space*, occupied in the centre by smoke flues and ventilating shafts, a warmed day-room could be constructed, surrounded by a glazed corridor or winter garden, with an outer walk for the exercise or recreation of convalescent patients.

“(h) The *internal administration* of a circular ward, including its supervision by sisters or nurses, would be very easy. Unusually ample space would exist for dining tables and seats for the patients, smaller tables for sisters, clerks, or dressers, and other conveniences. Movable surgical tables and screens might be arranged to travel on a circular tramway. Opposite to the proper corridor entrance, a door opening into a balcony might take the place of a window. A circular ward could readily be subdivided by high or low screens or partitions; whilst the control of the lighting, either by daylight or sunlight from the outside, or by central light from within, would involve very simple contrivances.

“From its abundance of space, the curved lines of its walls, the perspective of its numerous and evenly disposed windows, and its generally diffused light, such a ward would surely be far more cheerful and agreeable to the eye, for both patients and attendants, than a long straight ward.

“(i) The *disconnection of all ward offices* from a circular ward would be easy to accomplish. Placed outside the wards, on the corridors or elsewhere, such offices would be readily lighted and ventilated by intermediate passages or lobbies, having opposite windows. This, of course, would apply to nurses' rooms, ward kitchens, sculleries, lavatories, bath rooms, urinals, and water closets.

“(j) Lastly, the *administrative buildings*, the residential and official adjuncts necessary to every important hospital, including operating theatres, clinical theatres, and the out-patient and dispensary department, would be arranged in *quadrangular blocks*, from which the *circular blocks*, or *Ward Towers* for the *in-patients*, would be more or less widely detached, being communicated with only by the open or partially open corridors.”

Thus much of the “pretensions” of circular wards, which, as Professor Marshall says, are all in “the direction of sanitary improvement, comfort, and administrative facility.”

Turning now to what Mr. P. Gordon Smith has to say of the structural “pretensions” of circular wards, we learn that circular-shaped ward blocks can be at least as easily adapted to sites as ordinary shaped pavilions, while from his diagrams we infer that for certain forms of site circular blocks would have marked advantage in adaptability over pavilions. We have in view at the present moment a quadrangular site which, under the conditions of a pavilion arrangement, it has been held necessary to *pack tight* (we can use no other term briefly to describe the state) with buildings, where unquestionably circular blocks would have obviated the packing, and in other ways solved difficulties in the present arrangement, and with distinct advantage to the sanitary prospects of the hospital.

Again, circular blocks get rid largely of the question of position with reference to the points of the compass, to sunlight, and to prevailing winds. Subject to obvious ward management, the *maximum* possible equability would be secured in respect to light and ventilation for the several parts of the wards. The circular form, however, would not lend itself readily to small wards of four or six beds. On this point, and on the adaptability of the circular form to particular hospitals, Mr. Gordon Smith says:—

“I have nothing to add to Professor Marshall’s description of his typical ward of eighteen beds, except to say that about that size would be most promising for the architect. But it will be convenient that I should consider from the constructive point of view the limits of size within which the arrangements could be conveniently carried into effect. It is, of course, not claimed for the system that it is well adapted for very small wards; for to give in a small circular ward the same floor space per bed as in a large circular ward, an extravagant expenditure of wall space would be required, and indeed such disproportionate wall space would be wanted in order to prevent inconvenience from the convergence of the beds; otherwise the feet of the beds would be too close together. I do not think it would be either economical or convenient to make a circular ward for less than about eight beds. In such a ward it would probably be necessary to give each bed at least 10 feet of wall space. This, with the requisite space for the entrance doorway and the doorway to the w.c. projection, would require a diameter of 31 feet, giving a circumference of 97 feet, which would afford 80 feet for the eight beds and 17 feet for the two doorways. Possibly a ward for six beds might be feasible—the diameter being 25 feet 6 inches would give a circumference of about 80 feet, and this would afford fully 60 feet for the six beds. The average floor area per bed in the 31 feet ward (for eight beds) would be 94 feet, and in the 25 feet 6 inches ward (for six beds) only 85 feet superficial. But to pass to the greater limit—I understand this to be an affair not only of construction, but of what is best in ward administration, and I find authorities speaking of thirty beds as the number which had better not be exceeded in a single ward. I need, therefore, not refer to wards larger than this, but propose to examine simply the adaptability of a circular ward to thirty beds. Let 8 feet be the amount of wall space which it is desired to assign to each bed, and it will be found that a diameter of 84 feet would suffice to give this amount to each one of thirty beds, besides 24 feet additional for the necessary doorways. With such a diameter there would be not only the thorough separation between the feet of opposite beds gained by the circular system, but a quite unnecessary amount of central space. This suggests to the architect the advantage of utilizing the centre for purposes of support, and also for purposes of access upwards and downwards, and of subsidiary ventilation. I do not think there would be any objection to the middle of the wards being occupied by a block, say about 20 feet diameter, containing a central air shaft, surrounded by a staircase giving access to the roof. The floor area of such a ward would then be

5,541 feet
less for the central block (20 feet diameter) 314 „

leaving the net area of ward 5,227 feet
and this would give an average of 174 feet of floor space to each bed. But while

I have taken eight beds and thirty beds as the minimum and maximum limits for circular wards, I should very much prefer the size and number of beds to which Professor Marshall has referred in the ward he has described. The superiority of such a ward over a parallelogram-shaped ward having the same accommodation, as regards floor space in reference to the run of wall, is shown in pp. 14—16.

Mr. Smith discusses at some length the practicabilities of circular wards as to ventilation and warming, and appears to see no serious, if any, difficulties in respect to ventilation from the greater breadth of the ward as compared with pavilion wards, while as to warming, the circular form would present actual advantages.

With respect to the appearance of circular buildings and the architectural practicabilities of circular wards in this respect, Mr. Smith warms into something like enthusiasm, for he says, "the building may be enriched by recesses, alcoves, or balconies, may be quite plain, but the circular form of itself may be trusted to produce charming effects of soft light and shades. In fact, the circular form of hospital wards, in skilful hands, would lend itself in the most happy manner to the production of buildings which would undoubtedly be the pride of the towns possessing them."

A real difficulty as to circular wards exists with the probable cost. Mr. Smith thinks that this form of construction will prove more costly than oblong wards, and we are disposed to think that he has underrated rather than overrated the difference as against circular wards. But cost apart, Mr. Smith appears to accept Professor Marshall's statement of the sanitary advantages of circular wards, so far as they come under the cognisance of the architect.

Here then the question for the present stands. To us Professor Marshall's suggestion appears to be a distinct gain in dealing with troublesome questions of site and distribution of hospital buildings. There are circumstances, we are convinced in which the substitution of the circular form of ward for the oblong will admit, not only of a better utilization of site, but also of the utilization of sites which would be unavailable, or available only at a sacrifice of principles, for oblong wards. Whether under conditions of site which leave free choice to the architect, it would be desirable to substitute circular for oblong wards, the greater sanitary "pretensions" of the former being

justly held as a proper set-off against greater cost, is a question which can only be determined by its serious and detailed consideration in connection with a particular scheme. Such a scheme is to be found in the project of the Johns Hopkins' Hospital, Baltimore. We believe that the plans for this building have not been finally determined upon, and we are much mistaken if, when the " 'Marshall' System of Hospital Wards" (to use Mr. Smith's phrase), comes under the notice of Dr. John S. Billings, it does not receive such attention from him as will help to a clearer conception of the probable practical value of the suggested system.

A NEW PHASE OF PUBLIC HEALTH ADMINISTRATION.

THE Local Government Board, at the close of the seventh year of its existence, has taken occasion briefly to review what has been accomplished in regard to Public Health Administration during the period which has elapsed since its formation.¹ The matter is of special interest both as regards the past history and the future promise of the Board, and we propose to recapitulate or follow closely the Board's own words.

The Local Government Board was established in 1871, and to the newly created Department of the State were transferred—(1) The powers and duties of the Poor Law Board under the Poor Law Acts; (2) of the Secretary of State under the Registration Acts, the various Sanitary Acts, and the Local Taxation Returns Act; and (3) of the Privy Council under the Prevention of Diseases and the Vaccination Acts. The following year (1872) were also transferred to this Board the powers and duties of the Board of Trade under the Alkali Act, and the Metropolis Water Acts, and of the Secretary of State under the Highways and Turnpike Acts.

In 1872 the whole country was, by an Act passed at the instance of the then President of the new Board, divided into Urban and Rural Sanitary Districts, and each district was placed under the jurisdiction of one Sanitary Authority, and one

¹ *Seventh Annual Report of the Local Government Board, 1877-88, Blue Book.*

only. Provision was also made for the establishment of a Port Sanitary Authority for every port in England and Wales.

In 1874 the Local Government Board introduced and carried through Parliament a measure providing for various amendments in the sanitary laws which the administrative experience of the Board had shown to be imperatively required.

The next year (1875) a measure prepared by the Board for consolidating the whole of the Sanitary Law into a single statute was accepted by Parliament and came into force. This measure reduced into a methodical and complete whole provisions which hitherto had been scattered over no less than twenty-two separate Acts of Parliament.

In 1877 complete sets of model bye-laws were issued by the Board relating to almost all the various matters which local authorities are empowered to regulate by bye-laws under the provisions of the sanitary law.

"Thus it will be seen," observes the Board, "that during the last seven years a single central authority has been established and organised for superintending the administration of the laws relating to Public Health, Poor Relief, Local Government, and Local Taxation.

"Secondly, that the entire country has been divided into sanitary districts, and a local authority for sanitary purposes established for every district, and that no area is now without such an authority or has more than one.

"Thirdly, that the sanitary law has been amended and reduced into methodical form for the guidance of the several Sanitary Authorities referred to; and,

"Fourthly, that they have been supplied with a code of subsidiary regulations which when adopted, will enable them to give full effect to the more general provisions of the law.

"So far, therefore, as regards the organisation of the Central Department, the establishment of Local Sanitary Authorities, the consolidation of the law, and the framing of bye-laws, the work may be said to be complete; what now chiefly remains, at least for the present, is to encourage, instruct, and guide the local authorities in the discharge of their responsible duties."

The Board further adds that, although the period referred to

has necessarily been one of organisation and inception, a large amount of substantial and highly useful sanitary work has been accomplished by the Local Sanitary Authorities, who have in a large proportion of cases, as would seem, shown an earnest desire to avail themselves of the new powers conferred upon them. The Board moreover expresses its great satisfaction that notwithstanding the increased duties cast upon the Poor Law Guardians as the Rural Sanitary Authorities, the relief of the poor has never been so carefully and judiciously supervised.

This broad statement of the results of the Public Health legislation of 1871 and 1872 may, perhaps, be accepted without cavil; but except in a formal sense it will not be generally admitted either that the organisation of the Central Department, the establishment of Local Authorities, or the consolidation of the Sanitary Law is complete. Indeed, it is perhaps somewhat premature to assume that the present organisation of the Central Department may be final. The great interest of the statement rests, however, in the virtual announcement that the Local Government Board feels itself now in a position "to encourage, instruct, and guide the Local Authorities in the discharge of their responsible duties." Why such encouragement, instruction, and guidance should have been wanting during the initiatory stages of the Board's administration does not appear; but it is certain that the almost inextricable confusion into which local public health administration has fallen, notwithstanding the excellency of the general idea pervading the plan on which it is framed, is mainly attributed to the absence of encouragement, instruction, and guidance from the Local Government Board—in other words to the unintelligent manner in which the Board's initiatory administrative measures have been carried out. The time has come it would appear, for all this to be changed, and the new phase of administration which the Local Government Board now proposes to enter upon will be watched with profound interest.

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